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In Depth — How to distill volumes of information into more usable forms. Page 73.

King-of-the-hill battle to heat up, with IBM expected to announce a 486-based PS/2 on Sept. 12 in a bid to beat Compaq's first EISA system, anticipated next month and believed to also be based on the 486. Page 6.

Kodak may go further. Negotiations under way on outsourcing some applications development. Page 4.

Mail call for Unix as HP readies standards-laden 'open' E-mail package with ties to OS/2. Page 6.

Computer Associates lights up offerings for automated operations of large data centers. Page 101.

Stiff competition in greeting card business makes information systems a matter of survival. Page 55.

Internal DEC memo raises specter of intense budget cutbacks as firm looks to get lean and mean. Page 10.

War over; time for Prime cuts

BY NELL MARGOLIS
CW STAFF

NATICK, Mass. — After nine months of "It isn't over till it's over," it's over: Prime Computer, Inc. was officially bought last week by a white knight, New York-based venture capital firm J. H. Whitney & Co.

The approximately $1.1 billion buyout ended Prime's grueling fight against the hostile advances of MAI Basic Four, Inc. The question is, can Prime prove that this is not a Pyrrhic victory?

In a dramatic shake-up to the minicomputer industry, Prime's changes occurred the same week Wang Laboratories, Inc. hired its own turnaround executive (see story page 100).

Before the new board was even officially in place, Whitney partner Russell Planitzer, who served as treasurer of Prime early in his career and will return as chairman of the board, announced the appointment of former Gould, Inc. Chief Executive Officer and Chairman James W. McDonald as CEO of Prime.

The new Prime, as sketched by McDonald, will be a league of tightly focused businesses with individual profit-and-loss reporting. And, of course, it will be a private company.

"That certainly makes me feel more confident," responded Prime customer Dennis

To page 100

Change management

Wang and Prime appoint executives to take on challenges

Richard Miller
Wang President

- Cut runaway costs
- Improve employee morale
- Restore customer confidence

See story page 100

- Rebuild under private ownership
- Refocus operations
- Restore reputation
- Trim work force

James McDonald
Prime CEO

See story this page

Bearings a drag for IBM users

BY ROSEMARY HAMILTON
CW STAFF

If you ask IBM how it spells trouble these days, it should say: D-A-S-D.

A company spokeswoman confirmed last week that IBM will release an engineering change to users of 3380 Model J and K disk drives this week to correct a mechanical problem discovered more than a year ago. The company has quietly made several other efforts to address this problem since early 1988.

Users contacted last week reported several problems with bearings in the head disk assembly unit in their new drives. One user said 30% of the HDAs in his drives failed.

Meanwhile, IBM would not comment on its progress in determining the problem with the next-generation disk drive, the so-called 3390. In July, the firm abruptly canceled a scheduled announcement of the 3390, citing technical problems. Observers expected IBM to have determined the exact nature of that problem within a month. However, if it has, it is not saying.

Continued on page 14

Sun flares over fed proposal

BY AMY CORTESE
CW STAFF

Sun Microsystems, Inc. is staging an eleventh-hour campaign to block a proposed standard for a graphical user interface that could put the firm at a disadvantage for government procurement and deal a blow to its own standard candidate.

As the public-comment period for a proposal under consideration by the National Institute of Standards and Technology nears its Sept. 5 close, Sun President Scott McNealy and Vice-President Bill Joy are urging their customers to protest the action.

The NIST proposal would adopt the X Window System as a Federal Information Processing Standard. NIST sets standards for the federal government, whose procurements account for an estimated 10% to 15% of Unix sales. The agency is also considered a bellwether whose FIPS often go on to become broadly accepted industry standards.

Users, already fed up with waiting, want a decision. Jeff O'Neil, director of advanced systems at Arco Oil & Gas Co. in Plano, Texas, said standards battles have already caused delays, preventing innovative software applications from getting to market because developers do not know what to support. Arco is standardizing on X Window and the Open Software Foundation

Continued on page 8

Gerrymandering made easy in 1990

BY MITCH BETTS
CW STAFF

Advances in computer technology in the last decade, combined with a new digital map of the U.S., are going to make it much easier for political bosses to draw election districts to their liking after the 1990 census.

Interviews held with political consultants showed that gerrymandering — the art of drawing boundaries to favor one political party — is about to get worse, or at least more sophisticated. "We're going to see some wider abuse and perhaps even more blatant abuse," warned Thomas Hofeller, redistricting director for the National Republican Congressional Committee.

The reason for this alarm is that political bosses in state legislatures are gearing up to use sophisticated geographic information systems, load them with political and demographic data and come up with redistricting maps designed to protect incumbents and weaken opponents. "The technology enables you to do the job faster and with a more thorough appreciation of what the results will be," said Joe Shumate, a political consultant in San Francisco.

Under the U.S. Constitution, state legislatures redraw the boundaries of congressional districts every 10 years, following the nationwide census. The census determines how many seats each state will get in the 435-member U.S. House of Representatives.

Since the 1980 redistricting effort, affordable computers have become powerful

Continued on page 18

CW CHART: DOREEN DAHLE

Creative redistricting *by Massachusetts Gov. Elbridge Gerry evoked salamander image in 1812*

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8 Ashton-Tate CEO charts a frugal course until a fresh wind can fill his sales.

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10 How'dya like them Apples? The government does, awarding another contract to Sculley and Co.

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100 Richard Miller takes control of the Wang carousel, hoping it will turn around to his satisfaction.

101 Computer Associates sends a new regiment of products into the fray.

101 Business at Wang's secure systems division is the company's only secure thing right now.

Quotable

"We are not an acquisitions company. We have developed and integrated a lot of products in the past."

CHARLES WANG
COMPUTER ASSOCIATES

In an interview at a CA user group meeting. See story page 101.

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73 Refining techniques can dramatically reduce information overload and gridlock. By John H. Clippinger and Benn R. Konsynski.

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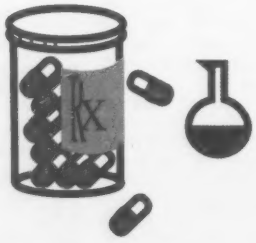
UPDATE

It's no big surprise that the two biggest consumers of the $260 billion worldwide computer-equipment pie are the U.S. (42%) and Japan (18%). What's surprising is how those shares are spent. In the U.S., nearly 20% of the $100 billion-plus earmarked for information systems goes toward software purchases. But in Japan, spending on software is a paltry 4% of that nation's $40-billion-plus IS equipment budget — a figure that is not growing very quickly. The European nations, meanwhile, dedicate about 17% of IS spending to software. Do the Japanese know something we don't know? Or could it be they do not know something we *do* know?

PAGE 1 COLOR PHOTO BY DAVID LEEFER

Electronic information refineries take in cluttered, useless material and release clean, more efficient information units. Page 73.



PCs played a key role in the months of testing that led to federal approval of the AIDS treatment AZT. Page 35.

EXECUTIVE BRIEFING

■ **Power brokers are poised to become power users** after the 1990 census. Politicians and political activists are expected to use sophisticated information systems to carve out new congressional districts based on the census. It's essentially what a 19th-century Massachusetts governor did with the stroke of a pen — gerrymander. **Page 1.** Redistricting is only one of the many new uses being found in government and, increasingly, in business for mapping technologies known as geographical information systems. Page 23.

■ **As today's companies become flattened,** networked and electronically integrated, the specter of information gridlock threatens to undermine the expected benefits of the technologies. Fortunately, there are techniques that can help IS overcome these problems. "Information refineries" employ computer-based processes that convert undifferentiated volumes of raw information into electronic form, extract the content units and recombine them into new forms for distribution. Page 73.

■ **It was inauguration time** for Prime Computer and Wang Laboratories last week as the troubled companies appointed new heads. Prime replaced its board with one backed by venture capital firm J. H. Whitney & Co. and tapped former Gould, Inc. Chief Executive Officer and Chairman James W. McDonald to become CEO. At Wang, former General Electric executive Richard W. Miller took over as president. **Page 1** and **page 100**.

■ **Information systems can give** a company in the greeting-card business more than a edge. It can place competitors at risk, says American Greetings Corp.'s Dean Trilling. Because everyone in the industry has the same high-tech tools at their disposal, those who do not use technology right run the risk of losing the race for survival. **Page 55.**

■ **Revising the dream:** Once DEC had hopes of co-opting desktop computing with its own hardware. However, the company seems to have let go of that dream in favor of a pragmatic approach in which use of its hardware is only one of many options and the emphasis is on broad-based and transparent desktop access to DEC minicomputers. With its Network Applications Support strategy, DEC has placed itself beside IBM in the race to the desktop without going head to head. **Page 63.**

■ **With the heralded introduction** of Ultrix-32, DEC's unified, single operating system approach has split into two parts, occasioning much speculation about the eventual fate of the longtime favorite, VMS. An educated guess is that a duality will persist. **Page 66.**

■ **Outsourcing continued to gain exposure** at Eastman Kodak last week as the company confirmed that it is negotiating long-term agreements to farm out some of its application development to consultants. That word came as Kodak announced companywide personnel cutbacks and business unit consolidation less than a month after signing an unprecedented contract to have IBM manage its data centers for the next 10 years. **Page 4.**

■ **The revival of the U.S. steel industry** has offered IS professionals high visibility as firms strive to revitalize their mills with technology. But there are limited opportunities, industry growth prospects are poor and the mills can be gritty. **Page 83.**

■ **IS groups need to revamp** their recruitment and training of entry-level employees. CASE tools and other new development aids call for an IS analyst with a different background and education. Traditionally oriented professionals should be encouraged to pursue maintenance work. **Page 97.**

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Kodak focuses on next outsourcing frontier

BY CLINTON WILDER
CW STAFF

ROCHESTER, N.Y. — Eastman Kodak Co., in a move that would blaze another trail on the outsourcing frontier, confirmed last week that it is negotiating with two prominent software services firms to possibly farm out parts of its applications development work on a long-term basis.

The $17 billion firm is negotiating with Andersen Consulting and Computer Task Group, Inc. (CTG) to form prospective partnerships in Kodak's internal software development efforts. Kodak continues to assess virtually all functional areas for possible outsourcing after last month's unprecedented agreement for IBM to consolidate and run its U.S. data center operations for the next 10 years [CW, July 31].

Kodak's information systems outsourcing efforts have been spurred by severe pressure to slash all operating costs. The firm announced plans last week to save an estimated $350 million to $400 million by cutting 4,500 jobs and selling or consolidating various business units.

Kodak chose CTG and Andersen from several firms that answered its request for proposals in applications development. "We were looking for firms that could provide more than 'body shop' work — partners who could manage projects and provide supervisors as well as analysts," spokeswoman Jeanne Eason said. "The applications work could be new development in some cases and maintenance in others."

At this point, even the most ardent outsourcing advocates among IS executives have considered in-house applications development a strategic function not suitable for outside vendors. But Kodak, according to a company source, is attempting to determine a more subtle distinction between strategic and nonstrategic applications within its own portfolio.

Kodak is also assessing most of its applications portfolio for possible migration to distributed, local-area-networked environments by the year 2000 [CW, July 24]. In one possible scenario, according to the source, the outside services vendor or vendors would focus on maintaining and upgrading current applications, many of which are 10 years old. That would free up Kodak's programming staff to move out to the business units and work on migration efforts.

No need to switch

The partnership, code-named Project Nova, would not necessarily call for Kodak software developers to become employees of CTG or Andersen. IBM hired away 300 Kodak IS operations employees to run and consolidate Kodak's four U.S. data centers. IBM officially takes over data center management Oct. 2.

Elsewhere within IS, Kodak has contracted with Businessland, Inc. to take over its personal computer purchasing and support for five years and is negotiating with Rochester Telephone Corp. for potential outsourcing of some telecommunications functions.

The different roles for Andersen and CTG in a potential partnership — as well as what specific applications would be involved — have yet to be determined. Although IBM would not be directly involved, the industry leader owns 15% of Buffalo-based CTG after an equity investment earlier this year.

Exchanges push trader Audit plan

BY ELLIS BOOKER
CW STAFF

CHICAGO — Stunned by the federal indictments of 46 traders earlier this month, Chicago's two commodity exchanges hastily announced a $5 million, yearlong project to develop a computerized auditing system featuring handheld order-entry terminals able to record the time of a trade as it occurs.

While the Chicago Mercantile Exchange and the Chicago Board of Trade (CBOT), the world's two largest commodity exchanges, said they have considered such technology in the past, the recent FBI indictments provided a strong incentive to speed up the effort.

"This is an idea we've kicked around for a year, but you can't deny that the indictments prompted our decision to deploy the technology," a CBOT spokesman said.

Dubbed Audit, for Automated Data Input Terminal, the project will be funded by the exchanges to the tune of $2.5 million each. Research will be directed toward developing keyboards that will allow the traders to quickly enter their trade and communications technologies for transferring the data to centralized computers operated by the exchanges.

Both LaSalle Street exchanges use so-called "open outcry" trading. The buying and selling of everything from soybean futures to Swiss francs takes place in trading pits where orders are executed by voice and hand signals.

In its indictments, the FBI alleged that inside this frantic setting, traders conspired to cheat customers by employing various schemes, including using inside information about a customer's order and then having accomplices make trades first, resulting in a profit for the trader and a worse price for the customer.

The FBI also said some traders executed a client's trade above the market price and then pocketed the difference and falsified records.

Electronic auditing systems have been considered by the exchanges in the past, but until recently, exchange officials had said the technology for the handheld order-entry terminals, which would be connected via radio- and infrared-based communications to exchange computers, was unavailable.

Some critics charged that the exchanges should instead rethink the activity of the trading pits. However, CBOT President and Chief Executive Officer Thomas R. Donovan said in a statement, "This new data input technology will allow us to retail the liquidity of the open outcry market while providing an audit trail system second to none."

On guard

The Chicago Board of Trade and Chicago Mercantile Exchange hope a computerized audit system will prevent the type of fraud with which exchange traders have been charged

CW CHART: DOREEN DAHLE

IBM ready to inoculate SAA with dose of knowledge tools

BY STANLEY GIBSON
CW STAFF

DETROIT — IBM plans to enrich its Systems Application Architecture (SAA) with an SAA-compliant artificial intelligence tool, an IBM official said last week.

IBM is currently working to merge two of its AI offerings — Expert Systems Environment (ESE) and Knowledgetool — into a hybrid SAA-compliant tool, according to Jack Wagner, manager of market development for knowledge-based systems at IBM.

Knowledgetool consists of extensions to the PL/1 programming language and is used in complex applications, while ESE is intended as a user-friendly development tool. A third product, Key/370, will not be included, according to Wagner.

The SAA knowledge-based system will take advantage of SAA cooperative processing with development being done on an OS/2-based workstation connected to an IBM 370, Application System/400 or OS/2 server. The product is not being designed for host-terminal work, Wagner said.

In addition, the SAA AI tool will have a common programming interface. The tool will also work with the IBM SAA repository, as do computer-aided software engineering (CASE) tools, according to Wagner.

CASE tools are expected to be able to create data objects that can be stored in the repository, which IBM is expected to announce Sept. 19 [CW, Aug 14].

Wagner noted that in the realm of AI, IBM has announced a converged strategy between its AIX version of Unix and SAA, in which an OS/2 client will be able to work with either an SAA or AIX host.

"What they need is one step beyond Expert System Environment and Knowledgetool to offer knowledge integration from the ground up," said Harvey Newquist, editor of "AI Trends" in Scottsdale, Ariz.

Newquist said the integration of SAA and Unix environments makes sense in the AI world because most AI work is now being done on Unix-based workstations. IBM accounts, however, will tend to migrate to SAA-based development gradually, he said.

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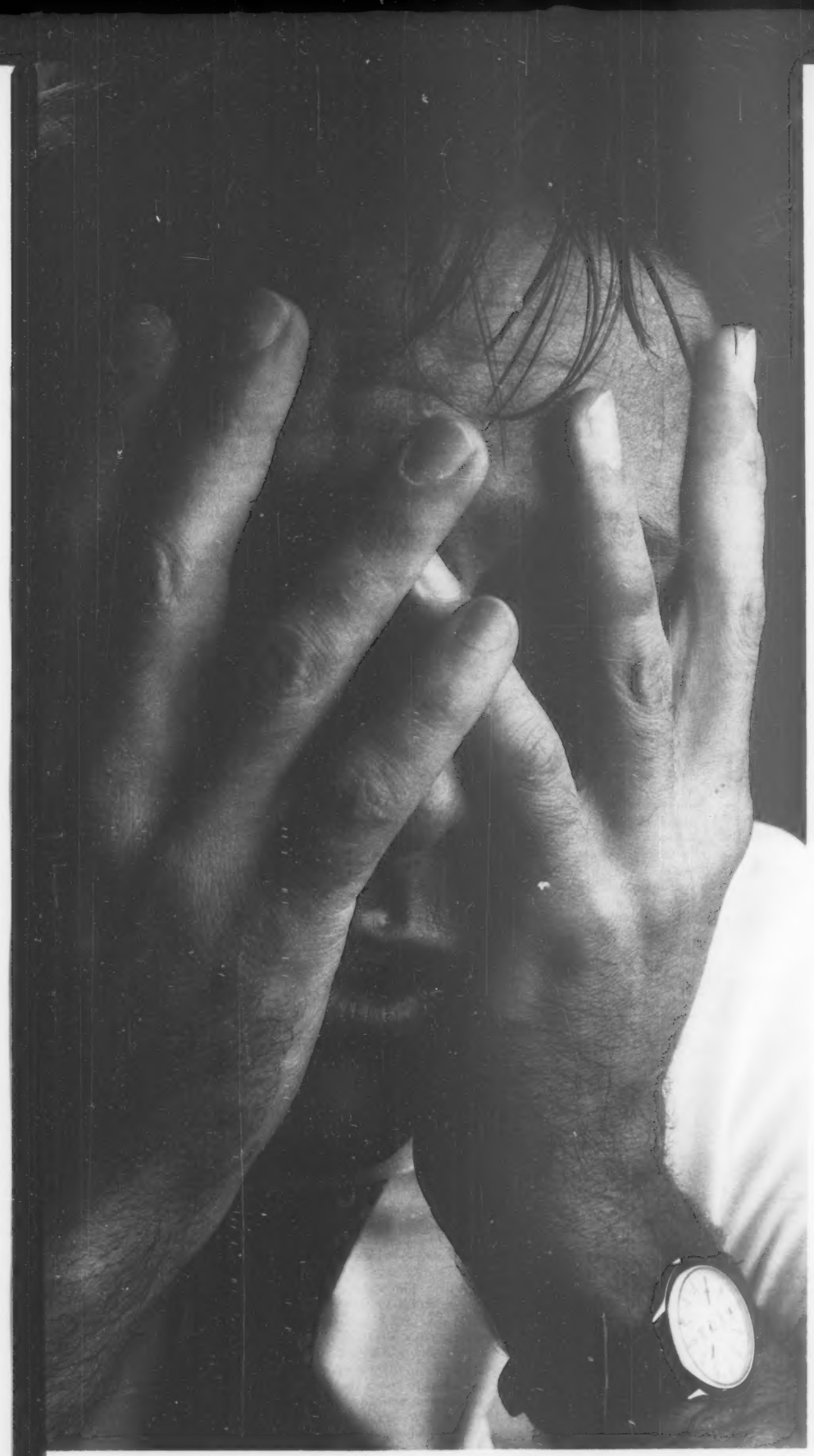

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Phones not hung up in strike

BY ALAN J. RYAN
CW STAFF

It was the threat of an operator strike that spurred Bell Laboratories to develop dial telephone service 70 years ago, says phone company veteran John Reddy: "That was the beginning of phone company automation."

The impact of the early automation efforts and those that followed has never been as obvious as it has during recent strikes at some of the divested Bell operating companies.

When workers at four regional Bell companies walked off their jobs earlier this month, the phone companies were not crippled by the strike. For many existing customers, the strike has had little or no impact.

The phone companies' ability to survive the work stoppage could mean less bargaining power for striking operators, technicians, service representatives and clerks, said Reddy, chairman of the College of Business at Pennsylvania State University's Wilkes-Barre campus and a 32-year veteran of AT&T and the regional phone companies.

Spokesmen at the affected companies said their large business customers are high on the priority lists, falling only behind services related to emergencies of public safety — such as phone service for doctors — or national security.

"We have a number of commitments to our large business customers who are moving their locations and who would be out of business without phones," said John Johnson, a spokesman for New England Telephone Co. The majority of phone lines can be activated remotely, he added: "That is helping us."

Lower on the priority list, smaller businesses and residences needing new phone lines installed are sometimes finding themselves trapped in a backlog of requests. However, most of the phone companies' spokesmen contacted last week said that residential and small business customers are getting service installed by the dates targeted when the installation is ordered.

"The ultimate objective of the strike, to be effective, would be to close down the company," said John Fleming, a professor at the University of Southern California's School of Business Administration. "Under present circumstances, the strike would have some impact on profits but nowhere near like shutting down the telephone company or making its service really very poor."

Johnson said that with 18,000 workers out on strike, his company cannot operate as smoothly as it would wish.

However, "it would not be inaccurate to say this company is in the best position it has ever been in" during a strike situation, and automation gets much of the credit, he said.

The increased use of digital and analog switches, which are replacing electromechanical switches in many cases, allows the phone company to activate or deactivate a customer remotely and to do remote troubleshooting. Automated ordering services in some areas allow customers with Touch-Tone phones to follow a series of commands to place a request for service.

Also important, said Michigan Bell spokesman Dean Hovey, is the increased use of fiber-optic cable.

"It is much less susceptible to outage during storms, which is one of the major concerns during the strike," he said. "The management people who are filling in for striking workers have their hands full trying to maintain service under normal conditions."

The workers, members of the Communications Workers of America (CWA) or International Brotherhood of Electrical Workers (IBEW) unions, are striking for better benefits and wage increases. By late last week, tentative agreements had been reached between the CWA and Pacific Telesis Group, and the CWA and some of the Bell Atlantic Corp. phone companies. Representatives of Nynex Corp. and Ameritech said no agreements had yet been reached.

Bell Atlantic Corp. spokesman Larry Plumb stressed that the fact that the phone companies have not stumbled without the striking workers does not mean automation could replace them.

Spokesmen for Pacific Bell (part of Pacific Telesis), New England Telephone (a unit of Nynex) and Michigan Bell (part of Ameritech) agreed. What has helped during the weeks-long labor dispute, they said, is that the companies were prepared for the possibility of the strike and had retrained managers to fill critical operational gaps.

HP to deliver Openmail as OS/2, Unix standard

BY STANLEY GIBSON
and ELISABETH HORWITT
CW STAFF

Hewlett-Packard Co. is expected to reach beyond its proprietary MPE-based world today by announcing Openmail, its contender for an electronic mail standard for Unix and, eventually, OS/2-based systems.

With the announcement of the X.400-based package, HP is trying to assert itself as a leader in standards-based client/server computing. In the past, HP offered only MPE Deskmanager, an E-mail package for its own minicomputers. "We want to make Openmail the standard for OS/2 and Unix," said Trevor Wing, HP marketing manager, in an interview last week.

Wing said HP will try to persuade Unix and OS/2 vendors to adopt Openmail. Although HP intends to create an OS/2 standard, the OS/2 version of the package will not be part of today's announcement. Pricing and late-1989 availability will be announced only for MPE, Unix, MS-DOS and Apple Computer, Inc. Macintosh systems.

Both Digital Equipment Corp. and Data General Corp. are expected to follow HP's introductions with similar announcements of their own. However, DEC's Unix-based E-mail system is likely to compete directly with HP's, whereas DG, which announced plans to license HP's New Wave user interface last week, could well become one of the early Openmail OEMs, although DG said it does not now support Openmail.

Christine Hughes, president of Myriad Research, Inc. in Miami, said HP's size should help it to assert a standard over a host of smaller Unix-based E-mail and office automation vendors. "At Fortune 500 companies, there is a lot of hesitancy to deal with these smaller vendors," Hughes said.

One large user, the U.S. General Services Administration, would welcome Openmail because it would provide users with more direct access to the FTS-2000 X.400-compatible E-mail network, according to Michael Corrigan, the GSA's deputy commissioner of telecommunications services. "All we care about is whether the system follows agreed-on X.400 interoperability standards" such as the Aerospace Industry Association's specifications, Corrigan said.

The key to HP's success in establishing a standard will be its ability to add value beyond the X.400 and X.500 standards, predicted Bruce Richardson, a vice-president at Cambridge, Mass., consultancy Advanced Manufacturing Research, Inc.

X.400 defines how messages are exchanged, and the still-incomplete X.500 standard defines a directory for keeping track of users and systems on an E-mail network. HP's New Wave provides a common user interface across a variety of workstations, differentiating its offering from those of potential ri-, Richardson added.

Openmail includes the following key features:

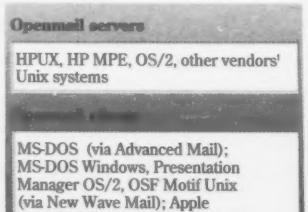
- Communications software that allows client workstations to exchange messages automatically with other X.400-compatible systems through Openmail servers that can be based on OS/2, HP's MPE or HP-UX or other flavors of Unix (see chart).
- A directory service that combines existing X.500 elements with HP extensions to keep track of E-mail resources in a centralized fashion — an important feature for large networks.
- A centralized administrative system that allows users to diagnose problems on the network, check bottlenecks and monitor queues.

DEC expects to announce its own native Unix implementation of an X.400-compatible E-mail system within 60 days, according to DEC Mailbus marketing manager Ronald Slayton. Currently, DEC offers a gateway between X.400 systems and Ultrix systems running popular E-mail protocols.

DG does not support X.400 at the moment, but it plans to do so in the future, according to a spokesman.

Mail call

HP servers will link client workstations to the X.400 world



CW CHART: DOREEN DAHLE

IBM releases PS/2s early in attempt to upend Compaq

BY RICHARD PASTORE
CW STAFF

IBM, trying to jump the gun on a potential Compaq Computer Corp. announcement of an Intel Corp. 80486-based personal computer, is expected to unveil two high-powered Personal System/2 models Sept. 12.

According to independent sources who were briefed by IBM and its business partners, IBM's new tower-configured PS/2 Model 90 will feature a 486 engine and will be positioned as a file server. IBM will also introduce an Intel 80386-based Model 75, which will have the same footprint as the Model 70.

"We believe IBM is pushing the Model 90 announcement specifically to thwart Compaq in their announcement of what we expect will be a 486 with EISA," said John Dunkle, vice-president of Workgroup Technologies, Inc. He said IBM initially planned a Sept. 26 announcement. Compaq would not confirm a time frame for any 486-based rollout.

The Model 90 will be priced in the $14,000 to $15,000 range, Dunkle said. "It won't be promoted as a single workstation, except for image-oriented applications. It will be positioned as a file server," which makes the price more reasonable, he explained. One source estimated that it will be a 25-MHz machine.

The Model 75 will sell for about $8,000 and will run at 33 MHz as opposed to the Model 70's 25 MHz, according to another source.

Neither of the new models will replace older PS/2 entries, sources said. "When [IBM adds] PS/2 models to their existing line, they don't cannibalize their current products," Dunkle said.

One source, however, said he expected IBM to provide a module utilizing Intel's I860 reduced instruction set computing microprocessor as an option for each machine.

Whether IBM or Compaq is first off the 486 starting line, neither will be able to ship a product before November and possibly as late as January, sources said. Intel is not geared up to provide 486 chips in quantities necessary for mass shipments.

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NEWS SHORTS

Buckner leaves Control Data

Control Data Corp. last week said that Chief Financial Officer John K. Buckner has resigned, effective Aug. 31. Buckner, whose duties will be assumed by President and Chief Operating Officer Lawrence Perlman, has been with CDC for the past three years. In other news, CDC began mailing an eight-page "fact sheet" last week to help financial analysts and reporters keep track of the sales, consolidations and market repositioning at the firm. The guide lists CDC's remaining businesses and services and details its five years of problems. What the booklet calls the "key numbers" are held for the very last page: On revenue of $3.6 billion last year, CDC generated just $1.7 million in earnings. The booklet states that CDC expects to be a $2 billion company in 1990.

U.S. Robotics looks to Europe

With an eye toward 1992 and a unified European Economic Community, U.S. Robotics, Inc. in Skokie, Ill., made its first corporate acquisition last week, buying British modem manufacturer Miracom Technology Ltd., based in Ipswich, UK. Miracom will operate as a subsidiary of USR Ltd., a wholly owned subsidiary of the privately held U.S. modem maker. Miracom had been selling U.S. Robotics gear under its own label as part of an agreement signed between the two companies last year. Terms of the acquisition were not disclosed.

Survey shows sharp 286 gains

Sales of personal computers based on Intel Corp.'s 80286 now account for 43% of the PC market, compared with 36% in the comparable 1988 quarter, according to an audit by Audits & Surveys, Inc. in New York. Sales of all PCs rose 24% for the quarter over the same period a year ago, according to the study, which also showed that low-end 8088 and 8086-based PCs have lost ground and currently account for less than 20% of the total market, compared with 32% last year. Meanwhile, the 386 machines have more than doubled their market share and account for close to one-fifth of the total market. "Nonetheless," said Carl M. Ravitch, senior vice-president of the auditing firm, "sales growth of these models has not been as rapid as predicted by many in the industry."

CASE vendors merge

Two beleaguered computer-aided software engineering vendors — Transform Logic Corp. and Nastec Corp. — united last week in hopes of reversing a tide of losses. The firms will merge in an agreement that will make Nastec, in Southfield, Mich., a wholly owned subsidiary of Scottsdale, Ariz.-based Transform. Both small firms have lost money in the past year.

DG inks Novell pact

Data General Corp. announced last week that it has licensed Novell, Inc.'s Portable Netware and will incorporate the product into its Eclipse MV-based servers as well as its Aviion reduced instruction set computing-based line of servers. Data General joins Prime Computer, Inc. and NCR Corp., both of which are currently licensing Portable Netware.

DEC forms software group

As the corporate soul-searching continues at Digital Equipment Corp., evidenced by reports of staff redeployments and cutbacks, the company has created a new division that will underscore the strategic importance of distributed computing for its future systems. In an internal memo dated Aug. 16, DEC Vice-President Jack Smith announced the formation of the Distributed Software Systems Group (DSSG), chartered with the development of operating systems and layered software for DEC's distributed environment. The group is headed by Bill Strecker, vice-president of product strategy and architecture and one of the key architects of the VAX line. DEC's open systems software business, PC integration software, software development technology, VMS and various security and standards groups within DEC will fall under DSSG.

Esber eyes turnaround effort

BY CHARLES VON SIMSON
CW STAFF

As the timbers supporting the company shiver under financial and product development strains, the political focus of Ashton-Tate Corp. remains firmly fixed on Chairman, President and Chief Executive Officer Ed Esber.

Fresh from the power struggle that forced the resignation of former President Luther J. Nussbaum, Esber has personally shouldered the responsibility for righting the course of the foundering company.

Esber has assumed day-to-day oversight of the troubled Dbase IV development project and says he may continue in that role until the product ships [CW, Aug. 21]. He has also sharply curtailed a number of development projects to focus Ashton-Tate's resources after laying off 250 of 1,700 employees.

"We have rethought our priorities," Esber said last week. "Any nonstrategic products have been curtailed or eliminated." While he would not be specific on products that were cut, analysts estimate that spreadsheet and word processing packages are likely candidates.

Esber was, however, specific on his role. "I am the CEO, and the buck stops here," he said. "If anyone does not think that we are serious about correcting these problems, they have missed the boat."

Some observers are more blunt. "Esber just pushed out Nussbaum," said John McCarthy, director of professional systems research at Forrester Research, Inc., a Cambridge, Mass.-based market research firm. "The powers at Ashton-Tate who got behind Esber knew the condition of the company. He will have to bring in some new people eventually, but for now it is up to him to turn it around."

Ashton-Tate's Esber *will oversee the production of the Dbase upgrade*

The task ahead

A turnaround promises to be a large burden. Industry observers said that Ashton-Tate will have to begin shipping Dbase IV Version 1.1, which will work with the Ashton-Tate/Microsoft Corp. SQL Server, by the first of next year for the company to stay competitive with such rivals as Borland International's Paradox. "By the end of the year, they have to ship a product with ties to the server," said Thomas Galvin, Ashton-Tate analyst at Smith Barney, a New York brokerage. "A lower end product is just maneuvering."

"There is the potential to be left behind," McCarthy said. "They have got to get something solid out the door by January."

Esber bristled at the mention of a January target date for Dbase IV. "We are out of the date business," Esber said. "I am tired of artificial deadlines. The product will ship when it is ready."

However, just to keep the firm strong enough for a timely release, Esber will need to pursue two parallel paths. The first is reducing corporate overhead in an effort to stem the financial slide. As part of that effort, the organization announced the layoff of 250 workers.

The second is getting Version 1.1 out the door. Bringing development muscle to bear on the project will not be easy. "Development is difficult in the middle of a restructuring," said Nancy McSharry, personal computer software analyst at International Data Corp. based in Framingham, Mass. "You work knowing that anyone not pulling their weight in the Dbase division will have to go."

Sun flares

FROM PAGE 1

(OSF) Motif look and feel. "NIST is trying to bring something to a head. I applaud what NIST is doing," O'Neil said.

Letters sent to customers and signed by McNealy and Joy argued that the proposal for a windowing standard is "premature and ineffective" and asked customers to "alert NIST to the costs of the proposed FIPS and the advantages of an alternative proposal" made by Sun. However, the X Window standard has widespread support from groups including X/Open Consortium Ltd., OSF and many computer vendors.

X Window, which grew out of MIT's Project Athena in the early 1980s, is based on the X.11 protocol and involves the various aspects of a graphical windowing environment for applications. In addition to providing a common programming interface for developers and a common behavior for end-user applications, X Window's networking capabilities allow applications to interact in multivendor networks.

While MIT was creating X Window, Sun was developing its own News. Sun has offered that as a candidate for a standard without much success, while MIT's X Window has gained widespread support.

While graphical user interface products are just now coming to market, most of the major new products, such as OSF's Motif and AT&T's Open Look, are based on X Window.

Making the News

Defending Sun's action, Charlie Simmons, director of marketing for Sun's federal division, said that the current form of X Window proposed to NIST is unstable, particularly the "intrinsics" level, or program interface, and that it would just have to be changed again.

Sun would like to see the proposal broken down into two parts, dealing with portability and interoperability, Simmons said. A common application programming interface would solve the portability problem, he said. However, standards groups are not likely to agree on a common interface anytime soon.

Simmons emphasized that Sun supports X Window; Sun's X.11/News is a merged tool kit that includes both X Window and Sun's News, which is based on Display Postscript. But if X Window became a FIPS standard today, Sun's current X.11/News would not comply, he conceded.

However, Open Look, which Sun created with AT&T, offers multiple tool kits, supporting both News and X Window.

If NIST's public-comment period generates changes, the proposal may have to go through another time-consuming review process, said Shirley Radack, computer standards program coordinator at NIST.

So far, Radack said, there has been general support for the proposed standard. However, several organizations, including Lockheed Corp. and government agencies, have had objections to the "intrinsics" portion of X Window, an intermediate interface underneath the tool kit level, she added.

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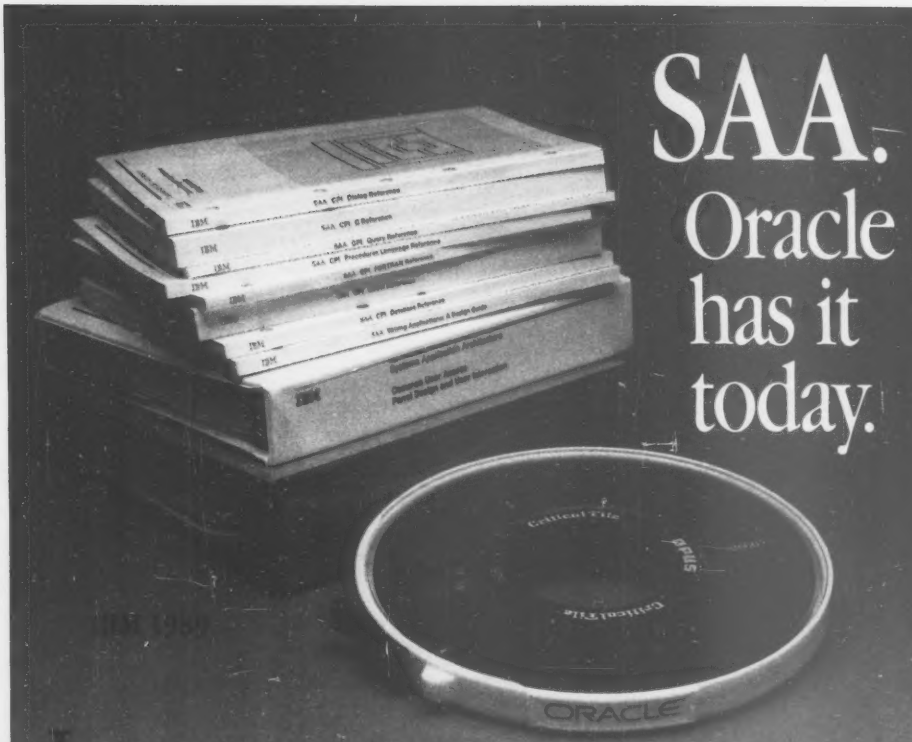

In 1978, IBM drafted the specification for a new relational database technology called Structured Query Language, or SQL. Then, in 1979, two years before IBM delivered SQL/DS, Oracle Corporation delivered the first commercial implementation of SQL and has since become the largest database company in the world.

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1:IBM Journal of SAA 2:DATAPRO survey, August 1988, companies with sales over $10 million 3:Donaldson, Lufkin & Jenrette report

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Big chill felt through DEC grapevine

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — A public glimpse of an internal cost-cutting memo from Digital Equipment Corp. last week sent a chill through a minicomputer marketplace already shuddering from layoffs, takeovers and financial failings.

Yet while DEC officials vigorously denied reports of the "L" word — layoffs, that is — industry analysts from Wall Street to San Francisco Bay applauded the notion of a "leaner, meaner" company with shrinking overhead and expanding sales and service.

"This is a company preparing itself for a really intense competitive struggle in the next few years," said Bob Herwick, an analyst at the New York office of Hambrecht & Quist, Inc. "DEC has always been, frankly, a little bloated. This is a fundamental repositioning of the company."

"Digital hasn't been doing well. The obvious short-term fix for something like that is to have a cutback," said Robert Kidd, an analyst at Dataquest, Inc. in San Jose, Calif.

The budget memo, cited in a Boston newspaper article, instructed DEC administrators in several departments — personnel, purchasing, finance and other support areas — to cut this year's operating budget by 10% and to start planning for budgets of up to 25% less by 1991.

That kind of reduction could translate into 7,000 fewer jobs in a company with 125,800 employees worldwide.

"It was an internal memo, written by one person – not a company policy, not a position, not a plan," said Jeffry Gibson, a DEC spokesman. "There is no 25% work reduction plan. There are no layoffs planned."

There are plenty of changes afoot, however. DEC is in the midst of streamlining its operation, moving as many as 4,000 employees from manufacturing jobs into sales and service. The firm has 32,000 manufacturing workers worldwide, but the number of sales and service employees is kept secret, Gibson said.

Salaries for its U.S. employees were frozen last month while the company decides its next move.

"I'm sure every manufacturer is facing work force imbalances," Gibson said. And while the company has a tradition of no layoffs, he added, "you can never say never."

Minicomputer companies are struggling in a sea of bad news these days, with generally gloomy forecasts for Wang Laboratories, Inc., Prime Computer, Inc. and Data General Corp.

Staff turnover through normal attrition, retirement and transfers at a company the size of DEC is expected to be several thousand people per year. But in today's more treacherous job market, employees may not be so willing to leap before they look, said Curt Beaumont, director of technology services at International Data Corp. in Framingham, Mass.

DEC could still trim its overhead substantially without losing employees, Beaumont noted, by chopping down expenses such as consulting services, travel budgets and staff educational programs.

Whatever trials are on DEC these days, they pale in comparison with the tribulations of other minicomputer companies, industry watchers pointed out.

Artificial intelligence puts *Voyager* on a smooth course

BY J. A. SAVAGE
CW STAFF

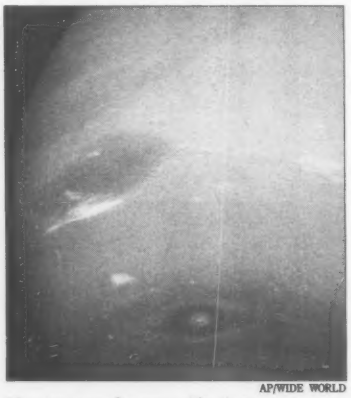
The *Voyager 2* spacecraft's rendezvous with Neptune, billions of miles away, produced more than pictures of the planet's rings. An artificial intelligence program designed to help those monitoring the flight operated as planned.

The program, called Spacecraft Health Automated Reasoning Prototype, or SHARP, is likely the largest such program in existence with 400,000 lines of code. It was built during the last three years by eliciting the knowledge of human monitors and crafting a set of rules to relate to hypotheses, according to Richard Doyle, supervisor of the lab's AI group. "The major part was getting knowledge out of the engineers' heads and into a form the computer can use," Doyle said.

SHARP was fired up about a month ago in parallel with the time-honored method of monitoring the spacecraft. The traditional way of checking the craft — making sure it operates as planned and diagnosing any problems — is done on six consoles with operators observing each monochrome screen as well as poring through thick, repetitive readouts of the condition of the spacecraft's equipment. What is not shown on the monitors must be filled in by the operator's knowledge.

Except for power outages, the SHARP program is running, according to Mark James, cognizant engineer working on the project for the Jet Propulsion Laboratory in Pasadena, Calif. "It's an order of magnitude of improvement over what they've got," James said.

While the human monitors are not yet relying on SHARP, the program has found two problems. When SHARP was first employed, it found a receiver that was not locking in on data. "It detected it, but didn't find a solution," James said. He said that SHARP also found a receiver noise problem that was undetected by the human monitors.



AP/WIDE WORLD

Neptune and some *of its features as seen by* Voyager 2

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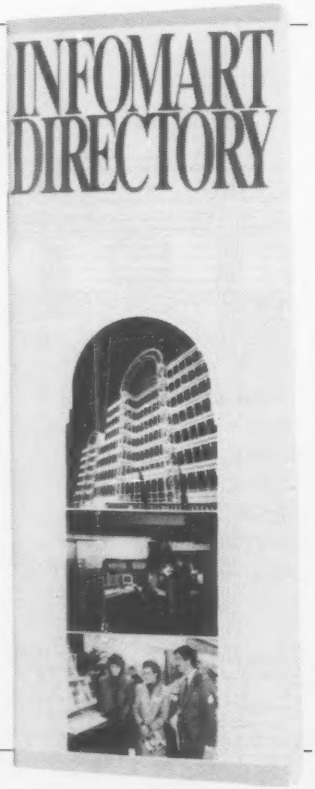

Apple secures military contract

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — The computer company that was once laughed out of corporate boardrooms continues to take the federal market by storm.

Only weeks after nailing down important contracts with the U.S. Postal Service and the Peace Corps, Apple Computer, Inc. scored another victory in its bid to penetrate the lucrative government market last week when it announced a contract to supply the U.S. Air Force with at least 10,000 Macintosh II personal computers.

Meanwhile, the National Aeronautics and Space Administration's (NASA) Johnson Space Center has also announced that it will be purchasing 2,500 Mac IIs.

An interesting aside is that both the Air Force and NASA contracts call for the older Mac II models, which are reportedly destined to be phased out as a result of strong Mac IICX sales. The Mac IIs are thus a good buy at the moment, partly because of the discontinuation rumors and partly because they can be easily upgraded through internal expansion slots.

The Air Force award comes under the umbrella of a $164 million contract awarded to Honeywell Federal Systems, Inc. Under the five-year contract, as many as 80,000 Mac IIs will filter down into virtually every level of U.S. military services worldwide. Analysts estimated that Apple's portion of the deal is worth around $50 million.

For years, Apple has struggled to get its foot in the door at federal agencies that have a bias toward IBM-compatible PCs. One clincher in the Air Force award was A/UX, Apple's version of the Unix operating system, which was developed to better its chances when competing for government contracts.

The sale represented the largest A/UX-related award since the system was introduced in February 1988, said Bill Coldrick, senior president of sales.

A Comparison Chart of the Major Cooperative Processing Software Products:

Functions:	SUPER-LINK® Family	Enter/3270®	IBM's HLAPI™	IBM's APPC™ or CPI-C™	SQL*Star®	Arbiter®	Automator™
Cooperative Processing Topologies Supported							
Server/Requester	YES	NO	NO	NO	NO	NO	NO
PC-based Front-end To Existing Programs	YES	YES	YES	NO	NO	NO	YES
SAA/CUA Front-end Created Without Host Code Changes	YES	NO	YES	NO	NO	NO	NO
Peer-To-Peer Communications	YES	NO	NO	YES	NO	YES	NO
Distributed Database	NO	NO	NO	NO	YES	NO	NO
PC Developer's Toolkit							
4GL Language	YES	YES	NO	NO	YES	NO	NO
DBMS	YES	NO	NO	NO	YES	NO	NO
Screen Capture Facility	YES	YES	NO	NO	NO	NO	NO
Forms Generator / Screen Painter	YES	NO	NO	NO	YES	NO	NO
Can Call 3GL Subroutines	YES	YES	NO	NO	YES	NO	NO
Scripting Facility	YES	Partial	NO	NO	NO	NO	YES
Virtual Operator Mode	YES	YES	NO	NO	NO	NO	NO
Local Mainframe Communications Simulator	YES	NO	NO	NO	NO	NO	NO
Debugger	YES	NO	NO	NO	YES	NO	NO
Form Testing & Debugging System	YES	YES	NO	NO	YES	NO	NO
Host-based Transaction Simulator	YES	NO	NO	NO	NO	NO	NO
Automatic COPY LIB Generation	YES	NO	NO	NO	NO	NO	NO
Micro-based Table Generation Utility	YES	NO	NO	NO	YES	NO	NO
Automatic Generation of PC-level Documentation	YES	NO	NO	NO	NO	NO	NO
File Transfer Support							
ASCII/EBCDIC Conversion Of Data	YES	NO	NO	YES	NO	YES	NO
Transfer Of Binary Files & Text Files	YES	NO	NO	NO	NO	YES	NO
Transfer Under Host Or PC Program Control	YES	NO	NO	YES	NO	YES	NO
Full SDLC Error Detection/Correction For Asynch Links	YES	NO	NO	NO	NO	YES	NO
Front-End Processing Support							
SAA / CUA Fully Supported	YES	NO	NO	NO	NO	NO	NO
Optional Host Screen Pass Through	YES	YES	NO	NO	NO	NO	YES
Dynamic Control of Field Attributes	YES	YES	NO	NO	NO	NO	YES
PC FORMS of Up To Four Pages	YES	NO	NO	NO	NO	NO	NO
Field-level, Context-sensitive Help Facilities	YES	NO	NO	NO	NO	NO	NO
Automatically Non-Intrusive Help	YES	NO	NO	NO	NO	NO	NO
Optional Learning Mode Automatically Displays Help	YES	NO	NO	NO	NO	NO	NO
Icon-based Menus	YES	NO	NO	NO	NO	NO	NO
Light-bar Menu Selection	YES	YES	NO	NO	NO	NO	NO
Dynamic & Programmatic Cursor Control	YES	YES	NO	NO	NO	NO	NO
Softkey Labels	YES	NO	NO	NO	NO	NO	NO
Text Windows	YES	NO	NO	NO	NO	NO	NO
Peer-to-Peer Processing Support							
Data Compression	YES	NO	NO	NO	NO	YES	NO
Call-level interface between host and PC programs	YES	NO	NO	NO	NO	NO	NO
All Host Databases Supported	YES	NO	NO	YES	NO	YES	NO
All Host Applications Supported	YES	NO	NO	NO	NO	NO	NO
PC Developer's Toolkit Included	YES	NO	NO	NO	YES	NO	NO
Software Distribution Support							
Programmatic Interface	YES	NO	NO	NO	NO	NO	NO
Time/Date or Checksum Host Query	YES	NO	NO	NO	NO	NO	NO
Background Communications Support							
Simultaneous Background/Foreground Processing	YES	NO	NO	NO	NO	NO	NO
Control of Communications From Foreground Program	YES	NO	NO	NO	NO	NO	NO
Communications Protocols Supported							
LU2 Support	YES	YES	YES	NO	YES	YES	NO
LU6.2 Support	Planned	Planned	NO	YES	Planned	YES	NO
Application Portability							
Front-End Processing to Peer-To-Peer	YES	NO	NO	NO	NO	NO	NO
DOS To OS/2	Planned	Planned	Planned	NO	YES	Planned	Planned
LU2 To LU6.2	Planned	Planned	NO	NO	Planned	YES	NO
Host Environments Supported							
IBM TP Monitors Supported							
CICS	YES	NO	NO	YES	YES	YES	NO
IDMS/DC	YES	NO	NO	NO	NO	NO	NO
IBM Interactive Systems Supported							
VM/CMS	YES	NO	NO	NO	YES	NO	NO
MVS/TSO	YES	NO	NO	NO	YES	NO	NO
DEC VAX Supported	YES	NO	NO	NO	YES	NO	NO
Minimum PC Hardware Requirements							
IBM XT or Equivalent With 640k	YES	YES	YES	YES	NO	YES	YES

Every effort to present an accurate chart has been made, however no guarantee can be made. Enter/3270® is a registered trademark of Aspen Research. Automator ™ is a trademark of Direct Technology. Arbiter® is a registered trademark of Tangram Systems. SQL*Star® is a registered trademark of Oracle Corporation.

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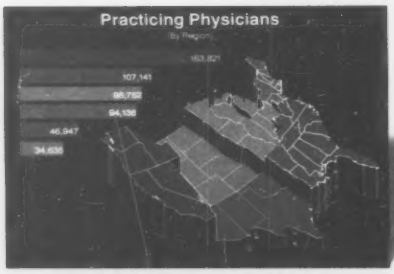

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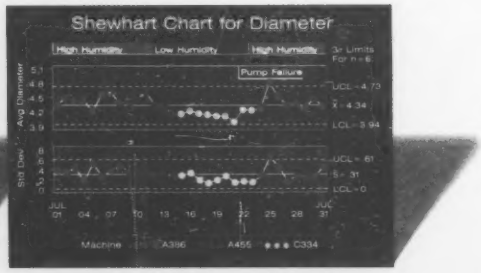

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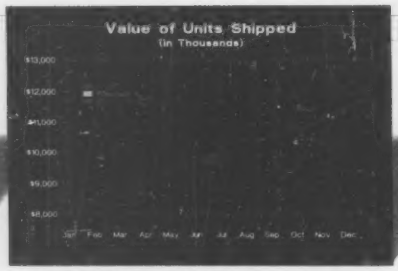

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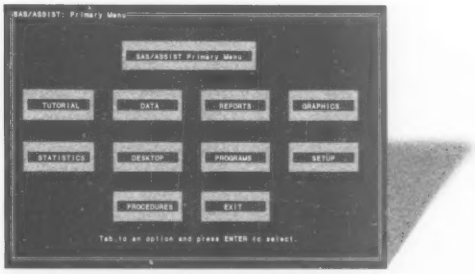

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IBM outlines SAA text processor plan

BY STANLEY GIBSON
CW STAFF

IBM clarified its text processor strategy under Systems Application Architecture (SAA) last week, saying that an SAA-compliant successor to Displaywrite will roll out in two stages.

Anthony Mondello, head of office systems at IBM's Application Systems Division, said the first stage will be shipped in March 1990 as the text editor in Officevision. The second stage, representing the full-fledged successor to Displaywrite, will be shipped after that, but Mondello declined to specify a date.

"We are essentially rewriting our word processor code to accomplish a couple of things: to bring Displaywrite under Presentation Manager and to bring the editor technology into the next decade," Mondello said.

The IBM executive elaborated on comments made a week earlier on IBM's SAA text editor strategy [CW, Aug. 21]. Mondello asserted that the text editor scheduled to ship with Officevision in March 1990 is part of the Displaywrite successor line. However, he added, Displaywrite itself will continue to ship separately and initially will offer more functions than the Officevision text editor until the second stage of the Officevision product is announced.

IBM considered rewriting all the Displaywrite code at once, Mondello said, but if that were done, a finished product could not be available until well after March 1990. Instead, IBM opted for a two-stage approach, with some SAA-compliant functions available in March and the rest later, he said.

Mondello avoided using the name Displaywrite to describe the follow-on product.

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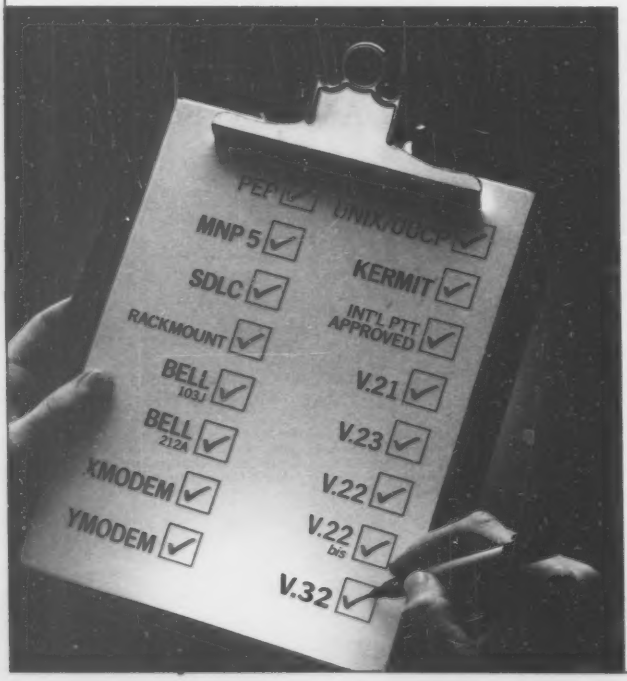

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IBM users

CONTINUED FROM PAGE 1

Nonetheless, analysts contacted last week said the latest speculation is that IBM will be ready to announce the new drive next month.

The 3380 engineering change, which replaces a bearing used in the HDA unit of 3380 J and K drives, will be made available at no cost to users who purchased a J or K drive before September 1988.

According to International Data Corp., a Framingham, Mass., market research firm, approximately 35,000 K drive units and 5,000 J drive units shipped prior to September 1988. The drives, announced in September 1987, began shipping in volume later that year.

A small problem

Ironically, the problem with what is currently its most technologically sophisticated disk drives comes down to simple mechanics. The culprit is a bearing used in the HDA unit, which is where the platters reside. The bearing helps the platters spin. Apparently, this bearing has the tendency to vibrate. That vibration, in turn, causes error messages and eventually drags down performance. Put simply, the vibration can throw the HDA's very delicate balance out of whack.

The distance between the recording head and the platter's surface is 10 microinches, or 1/200th the width of a human hair.

The bearing problem did not cause outright head crashes, users reported, but caused such problems as preventing access to data on the affected disks. An IBM spokeswoman said all drives purchased after September 1988 use an improved bearing and should have no problems.

Several users reported problems as far back as a year ago. Since that time, IBM has been replacing HDA units for customers when they request it.

The company also tackled the problem with preventative microcode earlier this year, releasing microcode that can detect very slight vibrations and then warn users that a problem exists. That way, users can fix a problem before it causes too many errors.

The Royal Bank of Canada had several HDA units replaced this year, according to John Wood, director of computer operations. "Yes, we've had problems in spades," Wood said, "but we have not had one failure with replacement units."

According to Wood, 70 of 264 HDAs have been replaced in a disk drive population of 132 units. Each disk drive unit has two HDAs. "Of the 70, we've had about three that have caused us some real problems," he said. "We haven't had lots of problems, but we've had to do a lot of work to avoid it."

The data center for the Commonwealth of Kentucky is another site that has replaced HDAs this year, according to Larry Ellis, direct-access storage device manager.

Ellis said he has made good use of IBM's warning microcode, which he said does alert him to a problem before it gets out of hand.

"That allows you to schedule a replacement, which is kind of a softer downtime," Ellis said.

Ellis said four HDAs have been replaced on the 16 disk drive units that were installed.

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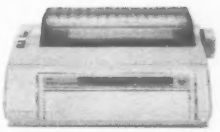

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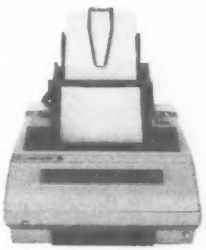

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Gerrymander

CONTINUED FROM PAGE 1

enough to handle the huge databases involved, and mapping software has turned the task from a spreadsheet job to a graphics application.

"Of course, the implication is that a lot more people are going to be able to draw maps — and that may overwhelm the legislature in terms of how much input it is getting," said William H. McGee, IS manager at the political division of Market Opinion Research, Inc. in Detroit.

In 1980, redistricting was done on mainframes, if it was done on a computer at all. This time, legislators are likely to use high-end workstations or minicomputers, depending on the size of the state and its database, McGee said. A state the size of North Carolina will have a database of about 2G bytes, he estimated.

The most dramatic change is the emergence of the first digital street map of the entire country, block by block. The map, developed by the U.S. Bureau of the Census at a cost of $345 million, is called the Topologically Integrated Geographic Encoding and Referencing System (TIGER) and is publicly available in a variety of computer formats, including CD-ROM [CW, June 12].

"The TIGER line file has made it possible to have a system where the map can interact with the population counts as you're drawing a district," said Craig Butler, director of research and development at Public Systems Associates, Inc. (PSA) in Denver.

The good news is that the fine granularity of the TIGER map and population data will allow legislatures to fine-tune their districts, ensuring that each one has the same population and thus provides equal representation in the House.

Federal courts have generally kept a hands-off attitude toward the political minefield of redistricting, except for expressing two fundamental rules: Citizens are entitled to equal representation (the "one person, one vote" rule), and racial discrimination should be avoided.

But experts said that legislators can easily stay within those broad guidelines and still come up with a gerrymander (see glossary this page).

"You can combine precinct data with census data, mapping software and electoral returns to pretty well design what kind of map you want to have — and it doesn't have to look like the old salamander. The lines won't have to be so out of shape," said Bob Blaemire, vice-president of Below, Tobe & Associates, Inc. in Bethesda, Md.

Of course, several sources noted that technology is a neutral tool. In other words, computers do not gerrymander; people do.

Furthermore, there is no such thing as a neutral election map, according to Kimball W. Brace, president of Election Data Services, Inc. in Washington, D.C. Every district boundary has a political impact and whether the boundary is a gerrymander depends on one's political persuasion.

"Whether you draw the line down Elm Street or Main Street, it's still going to affect the kinds of people in the districts on either side of those streets," he said. "You could draw all square districts and people that are hurt politically will say they are gerrymandered."

Jumping ahead

Officially, the first step in the redistricting process begins April 1, 1991, when the Census Bureau distributes the latest census data to the states. However, several firms are signing contracts with state legislatures to get their systems and databases set up in preparation for the high-stakes political exercise.

The major vendors in this niche market include PSA, Election Data Services, Market Opinion Research and Environmental Systems Research Institute, Inc. in Redlands, Calif., which markets the Arc/Info geographic information system.

The difficult task ahead is to integrate the blocks of the TIGER map with precinct-level election data and then build statewide databases that show voting trends and other characteristics, consultants said.

"Redistricting is geography. If you can't match the data to the geography [such as precinct maps], then all of the data in the world isn't going to help you," said Brace, who works with the Democratic party.

Many experts anticipate that a slew of political bosses and public-interest groups will be drawing up their own election maps on personal computers and flooding the state legislatures with hundreds of alternative plans to consider.

"Each state will establish its own way of dealing with this. The key, right now, is for the states to recognize that it's going to be a problem and work out procedures to handle all of this," Brace said.

Actually, there may turn out to be fewer alternative plans than people expect, because of the cost of developing the voter mapping systems, Hofeller said.

"Drawing a redistricting map that is balanced and meets the necessary criteria is a lot of hard work, even with a computer," he said. "Besides, as in the past, a lot of legislators will just ignore [the proffered alternatives]."

Each state has a different process for developing a redistricting plan, but they all must be passed by the legislature and signed by the governor within two years. Then will come the court challenges set forth by aggrieved politicians, civil-rights groups and others upset by the approved plans.

The conventional wisdom is that every state can expect to be sued by somebody over its redistricting plan. But challengers may be outgunned by state legislatures and political parties that have the funds for more sophisticated computer systems, experts cautioned.

The expected courtroom battles, pitting one group's computer program against another's, may force the courts to provide more guidance in the 1990s. "The courts have ruled for the first time that gerrymandering is a judiciable issue — and that's a breakthrough," McGee said. "But they haven't told us what constitutes an unconstitutional gerrymander."

Head count

Timetable for the 1990 census should place data in the hands of state legislators by early 1991

Census chronology

1990 *March 23:* Census questionnaires delivered to 106 million households

April 1: Census Day; due date for completed questionnaire mailback

April 26: Census Bureau begins follow-up with households that did not return questionnaires (probably 30%)

April through Oct.: Questionnaires tabulated as they are received at seven processing centers (using DEC VAX 8530s)

Dec. 31: Census Bureau gives total population counts by state to the president, for reapportionment of the U.S. House of Representatives as required by the U.S. Constitution

1991 *April 1:* Census Bureau provides states with data for use in redistricting

CW CHART: DOREEN DAHLE

Glossary

- **Burton:** (Often used as a verb, as in "to Burton.") The late congressman Phillip Burton, a San Francisco Democrat, drew an extremely partisan map for California's congressional districts after the 1980 census. It was designed to add five Democrats to the California delegation and slaughter Republicans.
- **Chilling effect:** When a redistricting map so weakens one party that its members have little or no chance of winning any election.
- **Gerrymander:** (Gerry + salamander.) To divide a voting area so as to give one political party a majority in as many districts as possible. The term is generally applied to the most extreme and partisan instances of redistricting. Named for Gov. Elbridge Gerry of Massachusetts, who in 1812 devised a district shaped like a salamander.
- **Packing:** A form of racially biased redistricting that puts virtually all minorities into one or two districts to limit their political impact elsewhere.
- **Unpacking:** Racially biased redistricting that spreads minorities over so many districts that there is little chance for a minority member to win an election.
- **Reapportionment:** Recalculation of the number of seats each state is allotted in the U.S. House of Representatives, based on the latest population census. Calculated using a formula called the Method of Equal Proportions to reach a total body of 435. Required every 10 years by the U.S. Constitution.

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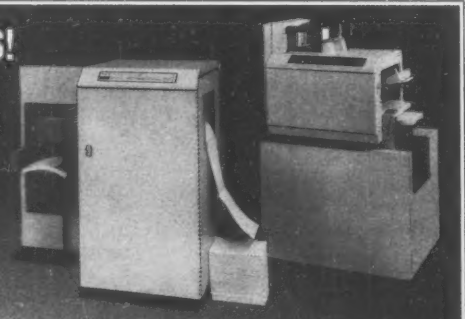

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Leading Edge files reorganization plan

BY ALAN J. RYAN
CW STAFF

CANTON, Mass. — Six months after the departure of former wig and blue jeans salesman Michael Shane, Leading Edge Products, Inc. has proposed a plan to its creditors to help it get back on its feet.

The personal computer clone distributor, founded by entrepreneur Shane in 1980, filed for Chapter 11 bankruptcy protection in early February with some $16.5 million in debt. Last week, the company mailed out a reorganization plan outlining options that will pay creditors either 45 cents per dollar owed in products and cash over three years or 100% in product alone over four years, according to John R. Sullivan, the company's newly appointed chief operating officer.

> "WE'VE BEEN holding our own through the last several months, and we now have about 400-plus dealers who have placed orders with us."
>
> JOHN R. SULLIVAN
> LEADING EDGE

"We are completely confident that the creditors will approve the plan," Sullivan said in an interview last week. Most of the creditors are dealers, he said. Creditors electing to vote on the plan — which will be funded by Daewoo Telecom, Inc. — must have their voting forms back to Leading Edge by Sept. 8. A Sept. 13 date has been scheduled for confirmation of the plan with Chief Judge James N. Gabriel of the U.S. Bankruptcy Court in Boston, he added.

Sullivan said that although the reorganized company will bear the Leading Edge name, the reorganization plan calls for the company to be purchased by Daewoo, the Korean-based manufacturer of the Leading Edge PC. The plan was filed by Stephen Gray, the court-appointed trustee of Leading Edge.

Gray, in conjunction with Daewoo, appointed Sullivan to his position as COO. Sullivan said that there are currently no firm plans for other officers of Leading Edge once it is bought by Daewoo. Sullivan, who had left the company briefly prior to its latest financial woes, was at one time senior vice-president of marketing at Leading Edge.

Leading Edge resumed shipment of products to dealers in April. "We've been holding our own through the last several months, and we now have about 400-plus dealers who have placed orders with us," Sullivan said, adding that some dealers place orders on a weekly basis. "Considering the circumstances of still working under reorganizational bankruptcy, we are very pleased with those results."

Still, there are dealers who gave up on Leading Edge long ago and who are not looking back now. Tom Jacobs, chairman of Computer Town in Nashua and Salem, N.H., said Leading Edge owes him a nominal amount of money, and he is not very interested in the reorganization plan. "We've taken on the Hyundai [Electronics America] PC, which we are pleased with," he said.

The negative publicity associated with the Chapter 11 filing has hurt Leading Edge sales, according to Sullivan.

However, Bruce Stephen, a microcomputer analyst at Framingham, Mass.-based International Data Corp., said that all hope is not lost for Leading Edge. "There is an awful lot of value attached to the brand name, and that is what Daewoo thinks will allow them to continue selling the product," Stephen said.

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EDITORIAL

Don't hold back

IF YOU'RE ONE of the many managers who hasn't bought into IBM and Microsoft's OS/2 as yet, the recent bombshell from Ashton-Tate may provide a clue about where you want to take your information systems strategy.

The company conceded that it floundered in its efforts to structure the SQL database standard under the limitations of MS-DOS and that even without SQL and related communications functions, it will still need to redevelop Dbase IV to utilize so-called DOS extender technology. Ashton-Tate thus joins Lotus in that hall of misery, as 1-2-3 Release 3.0 was also delayed and restructured around a DOS extender.

MS-DOS is a worthy operating system for stand-alone desktop applications in use to this point. But it seems increasingly clear that a venture beyond individual desktop computing into the realm of enterprisewide computing — and even to drive those stand-alone applications to new levels of function and performance — is going to require a lot more room to flourish.

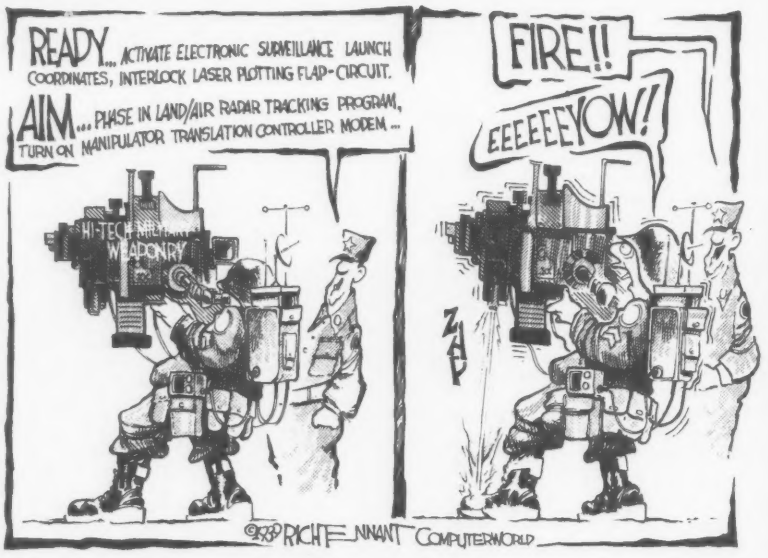
With the purported wonders of client/server database applications now on your doorstep, it may well be time to ask how much longer it makes sense to hold on to the tried-and-true.

MS-DOS has become like a familiar glove as the fears of personal computing have eroded. And yes, it has matured with the addition of extenders and with such enhancements as the hiding of the villainous A> prompt. But despite the current allure of the memory-constrained operating system among sudden end-user converts, it should not be forgotten that little more than two years ago, it was universally damned as too limited for the potential of the Intel 80286 microprocessor. Now we're on the verge of adopting personal computers based on the next-generation 80386 and even the fourth-generation I486.

DOS extenders may well do the job in opening up PCs to memory-intensive applications. But does it really sit comfortably to rely on what is essentially a Band-Aid approach when there are other operating system standards that were designed from inception for multiprocessing, multiuser applications?

The hardware now available is light-years ahead of current software technology. It is more than reasonable to ask why much of the industry seems so content to shackle technological progress to the limitations of MS-DOS.

The move to a more sophisticated PC operating system seems inevitable, and it is up to vendors such as Lotus and Ashton-Tate to lead the way. What those companies have to realize is that the types of applications promised by such powerful environments as OS/2 and Unix feature more than better performance for the power user. They can also support the interfaces and communications tools that new users — and even the average PC user — need to be able to enjoy and fully utilize a desktop system.



LETTERS TO THE EDITOR

Order of the court

I read with interest "IBM crackdown uncovers signs of counterfeiting ring" [CW, July 10]. Unfortunately, you misunderstood the nature of the Anton Piller Order obtained by IBM in Hong Kong. Because this is an important remedy available to those suffering from piracy in Canada, the UK, Australia, Singapore and Hong Kong, it might be worthwhile to provide a clearer explanation of it.

The Anton Piller Order is named after an early UK case in which the remedy was granted. This court order is available in British Commonwealth countries in cases involving intellectual property piracy where it is feared that the pirates will destroy the evidence of their piracy if normal court procedures are followed. It is given *ex parte* — i.e., without giving notice to the other side, at the pretrial stage and authorizes a plaintiff and his lawyer to enter the defendant's premises and seize evidentiary material that might otherwise disappear before trial.

In essence, it is a civil search-and-seizure order. The seized material is usually kept in trust by a court-appointed agent pending the trial.

The remedy can be useful in those instances of intellectual property piracy where the pirates maintain an inventory of infringing materials, tools or machines used in the infringement and business records evidencing the extent and profitability of the infringement. This material, once seized, may be used to prepare the case against the pirates.

C. Ian Kyer
Attorney
Faskin & Clavin
Toronto

Upgrade not clone

AST's introduction of an I486 upgrade hardly fits your characterization as a "clone" product [CW, July 3]. Indeed, the two products are quite distinct.

First, our solution will upgrade either a 25- or 33-MHz AST Premium 386 personal computer. What's more, we didn't develop the Fastboard 486 as an imitation of a competing technology. Our patent-pending Cupid-32 architecture was designed over a year ago with just such an upgrade path in mind.

AST's Cupid-32 architecture separates the Industry Standard Architecture (ISA) compatibility portion (I/O bus) from the high-speed processor/memory/cache bus. This allowed us to develop a single motherboard with the ISA compatibility built-in; it is not the "daughtercard" employed by other vendors. IBM's solution does not include external cache, while AST's design includes 64K bytes of external cache plus a socket for Weitek's 4167 math coprocessor and support for high-speed burst mode. Also, we recognized that an I486 solution would demand the number of drive bays and expansion slots in AST's Premium 386/25 and 386/33 CPU housings.

Joel C. Don
Public Relations Supervisor
AST Research, Inc.
Irvine, Calif.

Keep phone book

"Letting your PC do the walking" [CW, June 5] should not merely be seen as another triumph for technology. The telephone directory is useful because it gives you the phone number given a name, cross-checked with an address. It is also useful because it cannot give a name or address, given a phone number.

The availability of the directory in computer-readable form will enable, for example, a burglar to determine the phone number of a house and call to see if someone is in, among other undesirable activities. Phone users may not appreciate such a use of information to themselves.

It can be argued that with a scanner and OCR software, even a printed directory can be made computer-readable and indexable. Should one also by such token be against a printed directory? This question is similar to whether the audio industry is justified in opposing digital audio tape just because its technology allows for perfect quality.

K.C. Toh
Managing Director
Unidata Sdn Bhd
Malaysia

Fannie a follower

Fannie Mae's marketing strategists mentioned in "Lending a high-tech hand" [CW, May 15] are certainly to be congratulated for their August 1988 decision to develop loan stratification software for PCs. The praise must be tempered somewhat by the fact that competitor Freddie Mac's customers already had this capability in 1987.

Anthony P. Mayo
Reston, Va.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

IBM's OS/2: Love it or leave it

CHARLES P. LECHT

My decision to write this was prompted by all the nonsense I heard about OS/2 during a recent trip to the U.S.

Having come from my home in Tokyo, I could hardly believe it. It was the same garbage I've heard following just about every announcement of a major operating system since the late 1950s. Those of you who were not yet teething then, or even in the '60s, may not know what I mean, so I'll explain. Since those days, every time a new operating system was announced by a leading manufacturer (usually IBM, but sometimes other manufacturers), a lot of flack went up about what it didn't have or couldn't do, what its predecessor had that it didn't, and why switching to it might be a downright sin! The nonsense was awesome.

The next thing you heard was how some monumentally better "alternative" existed and why only a dummy wouldn't use it. Committees were formed to tell the new system's manufacturer off for not making the system the way they thought it should have been made or to bolster the "alternative" community as though this were a moral issue deserving of World Court attention. Some extremists — computer people can be emotional — would even go so far as to suggest that the announcement signaled a conspiracy to seduce the world computer community into complacent subservience to the manufacturer.

I've always understood and, being American, even sympathized with this fruitcake stuff. Taking potshots at any big guy is an old American tradition that finds its origin in distrust of anyone at the top. But fairness is also an American value, and in the case of OS/2, I believe its critics to be unfair.

In my view, Microsoft, OS/2's creator, ought to be given a medal for the system. It is a monumental piece of work that deserves our praise. And I'm not saying this as a distant observer. I've participated in and observed OS/2's usage in Japan for two years and have found it a mighty impressive system. In Japan, OS/2's bilingual (Japanese and English) capability is a must, but that's not the only reason I say this.

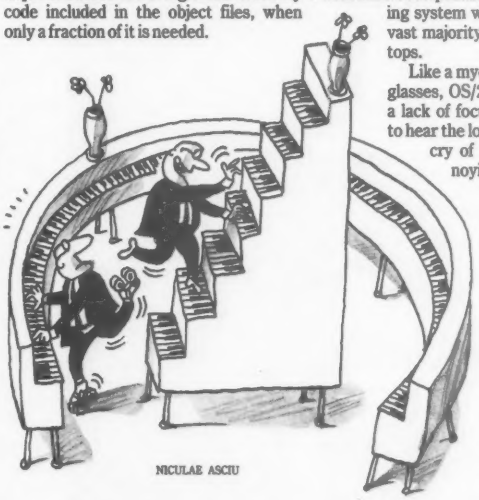
IN MY VIEW, Microsoft, OS/2's creator, ought to be given a medal for the system.

No other PC-based general-purpose operating system offers the power of OS/2 while being so easy to use or so error-free. That IBM decided to offer it on its latest PCs only signifies the historic wisdom of IBM management in selecting products that will endure in the marketplace. Where are all those MS-DOS competitors (CP/M and the vendor-proprietary systems) of the early- to mid-'80s?

Switching from MS-DOS to OS/2 for the serious PC user with 80386 power at his disposal provides all the sensation of switching from a donkey to a team of Arabian horses. The ease with which the user can start and maintain dozens of sessions of varying applications is truly astonishing. This feature transforms a simple PC into a multipurpose workstation able to run communications packages, spreadsheets, graphics — whatever — all at the same time.

In the arena of software systems development, OS/2 also deserves great praise. The ability to edit, compile and test software on a PC in a round-robin of sessions doubles and redoubles development throughput.

Another attractive OS/2 feature is dynamic linking, which allows software modules to link to other needed modules at load time. This means that programs, especially simple ones, may be spared the unpleasantness of having loads of library code included in the object files, when only a fraction of it is needed.



NICULAE ASCIU

All this and more is completely transparent to the user, as is the automatic virtual memory management system provided by OS/2 and built around the 80286 architecture. Users need to know no more about how OS/2 works than does a driver about how his automobile engine works. Transparency is what PC users want.

Now my purpose here isn't to put down DOS. It was the best thing around for a long time, and for certain microprocessor-based systems — those with less power than the 80386 could offer — it's still the best. That it won out over its alternatives such as CP/M and earlier versions of Unix lets you know what the PC marketplace ultimately thought of those systems. My purpose is not to demean OS/2 alternative systems like today's Unix either, although I confess that I consider all of these far less user-friendly than OS/2. Remember, desktop computers are primarily made for commercial users, not large systems software developers who are the core audience for Unix.

Are Unix-based alternatives just as good? For some applications, they may be better. However, that's not the issue here. What is the issue is the noise demeaning OS/2. It's plain nonsense if you ask me.

Lecht is an IDG News Service correspondent based in Tokyo.

DOUGLAS BARNEY

Well before it was announced or shipped, people got excited about IBM's new operating system, OS/2. Most, particularly those who bought the original IBM Personal Computer AT, expected an operating system much like MS-DOS but with multitasking and memory limitations that only the most power-hungry power users could hope to use up.

Thinking about this made personal computer diehards — and those who followed the industry — giddy.

This occured in 1985 and 1986. The glee faded in 1987 when OS/2 was finally announced — and disappeared late that same year when the operating system shipped. That is when end users and IS alike began to realize that OS/2 was an overbuilt incompatible beast of an operating system with no place on the vast majority of American desktops.

Like a myopic person without glasses, OS/2's main problem is a lack of focus. Microsoft failed to hear the loud but simple battle cry of users: End the annoying and debilitating 640K-byte limit of MS-DOS!

A smaller group, most of whom took long, forced breaks as five-font spreadsheets printed, also wanted their machine to do more than one thing at a time.

Those with IBM PCs and XTs had fewer hopes. They knew their machines, driven by the paltry Intel 8088 chip, were forever crippled, doomed to a life of single tasking and smallish data nets. PC AT owners, however, bought the machine on a promise that an operating system was on the way to unlock the glories of the Intel 80286 chips. Needless to say, the PC AT and its clones sold like files at a prisoners' convention as everyone, it seemed, geared up for the new MS-DOS.

The wait has been over for a while, and users are still not amused. Most annoying is the fact that the original 6-MHz PC AT cannot run OS/2 effectively. Many now believe that an Intel 80386 is really required to get adequate performance, especially when multitasking. Unfortunately, OS/2 does nothing to exploit the 32-bit architecture of the 80386.

Because Microsoft and IBM designers followed their dream instead of listening to customers, OS/2 continued to bulk up until it overgrew its original target.

This is only one component of OS/2's overall "ouch" factor. It also hurts in the wallet. To run effectively, OS/2 requires anywhere from 2K (keep dreaming) to 10K bytes (that's more like it) of random-access memory, a fast processor, a large hard disk, a high-resolution graphics board and monitor, a mouse and a whole new complement of applications. If you can bring yourself to do the arithmetic, you might find yourself staring at $3,000 to $5,000 to upgrade an older system so it can run OS/2. Then you need new applications. Try cost-justifying that to a CEO bracing for a possible recession.

OS/2 has other problems. Here's an experiment. Go to your local dealer and ask for the OS/2 department. Tell the salesman you are interested in *the* major packages: Dbase IV, Professional Write, Microsoft Excel and versions of the operating system for the five or so brands of clones you have in your shop.

Then watch the salesman laugh. You shouldn't expect those things to be available. After all, OS/2 has only been out a year and a half.

It is one of those vicious and perhaps endless circles. Vendors blame the shortage of products on a lack of demand. Users blame the lack of demand on a shortage of products. The real blame is on an operating system that is too big, too ambitious and too late.

If these problems are not resolved, then OS/2 will blow its chances at the big time. Already, the delays in shipping, applications development and user implementation are creating opportunities for systems that really have no other good reason for succeeding. How else can one explain the excitement over Unix, an operating system that the industry long ago dismissed for its bulk, market fragmentation, coarseness and overall awfulness?

Now this dismal 20-year-old creation is suddenly important simply because it has multitasking, large-memory addressing and, unlike OS/2, it has applications. Vendors are marrying themselves to Unix, not because of good looks or personality, but because it is the only one that really cooks.

DOS-extender vendors, originally just stopgap companies, are also benefiting from anemic OS/2 sales. A DOS extender essentially allows a recompiled application to run in protected mode, a techie way of saying the program can use up to 16M bytes of RAM.

Unlike OS/2, DOS-extended applications use but don't really require extra memory. Users can hurdle the 640K-byte barrier without major hardware upgrades, but they gain little in the way of multitasking and interapplication communications. This kludge has only become important because OS/2 has failed to deliver.

DOS extenders and Unix, which should never ever have gained a foothold, now look to become mainstream. With enough momentum behind these flawed alternatives, OS/2 may never catch on and will certainly never achieve what had seemed to be its simple and achievable destiny: to replace MS-DOS.

Still, many vendors plod along with OS/2 projects. Eventually they will be complete and some users will have a real reason to switch. And if all goes well, OS/2 may even become a key operating system for the 1990s. But it has utterly failed to solve user problems of the 1980s.

For this, the powers that be should be ashamed. Maybe next time they will stop and listen to users. Or maybe they will just blow it all over again.

Barney is editor in chief of *Amiga World*.

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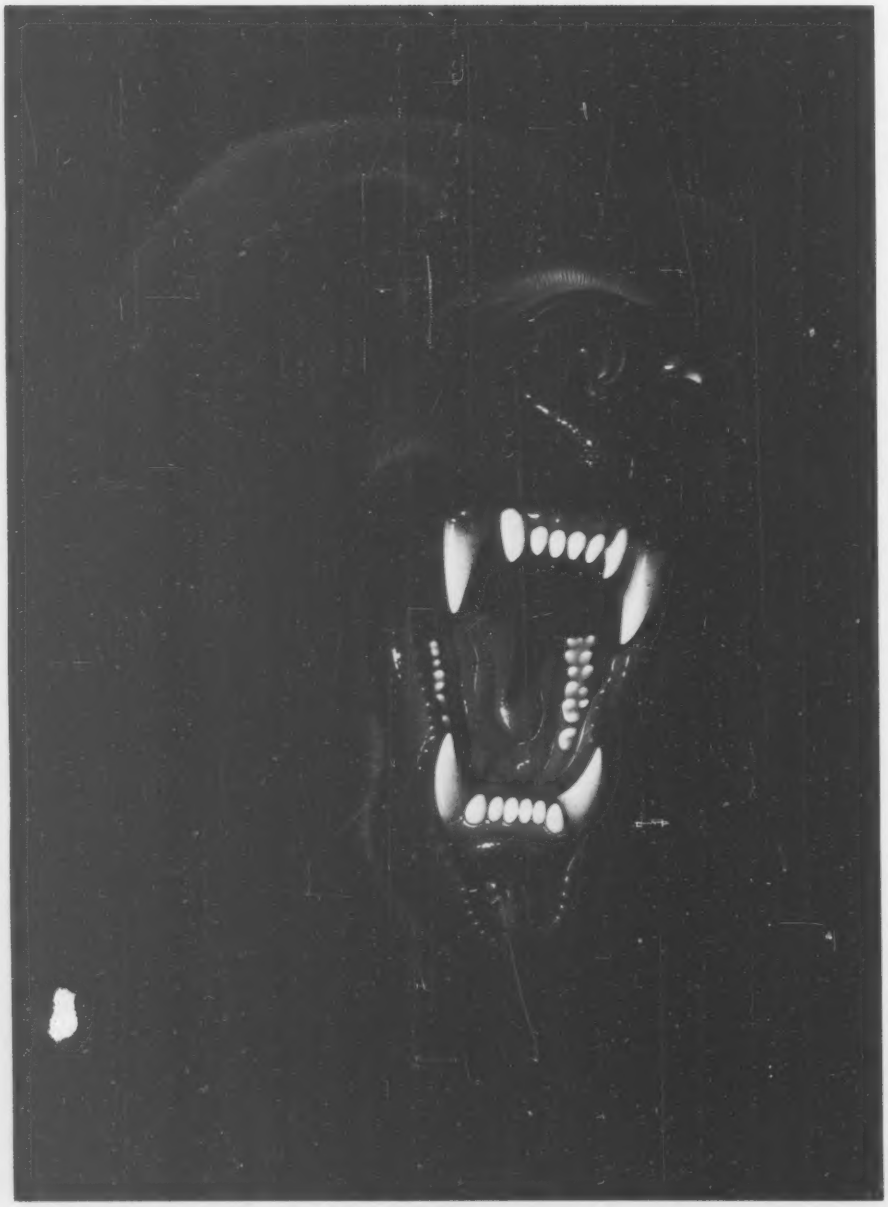

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SOFT TALK

Stanley Gibson

A new lease on life

IBM first built its name and fortune on leasing tabulating machines. When computers took over in business record keeping, IBM leased those, too. Now the company is sagely planning to build its future on software leases.

In the 1950s, IBM's revenue stream from equipment leases was a key weapon in establishing the firm's dominance in the fledgling computer industry over such rivals as Remington Rand, Honeywell, RCA and others.

IBM may not have known a lot more about computers than these firms, but it did know about leasing business machines such as tabulating devices, card punchers and so on. IBM took the money it earned on those devices and plowed it into computer research. Its rivals had no similar source of revenue, and IBM was soon able to outstrip them.

IBM fundamentally changed its business in 1982 when it began to emphasize hardware sales over leases. The initial boom in hardware sales revenue gave it the fattest years in its history. But those years

Continued on page 28

Mapping the way

Geographic info systems showing payoff

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

On the far western edge of Alaska's Kenai Peninsula, the city of Soldatna is experimenting with one of the newest computer technologies to create "smart maps" that reveal delinquent tax parcels. One major result: the discovery of $8 million worth of back taxes among a population of 50,000.

Back in the "lower 48," the city of Saginaw, Mich., is using mapping software to monitor maintenance problems over 300 miles of water mains and 312 miles of storm drains.

In the San Francisco Bay area, the civil engineering firm of Bissell & Karn uses a graphics design system for such site development and transportation projects as adding a four-mile-long highway lane.

Each of these cases demonstrates the reach of geographic information systems (GIS), which sprawl across the map from political redistricting in Cook County, Ill., to automating sewer inspections in Seattle.

The sleepy technology of automated mapping systems — around for two decades now — gradually awoke during the past two years. GIS is sharpening its focus, running on cheaper hardware and employing better software such as relational database management systems.

"GIS is going to be one of the major opportunities in the 1990s," said Eric Loken, a vice-president at GIS vendor McDonnell Douglas Corp.

Nationwide, GIS industry growth is likely to be one of the most dynamic computer systems-related businesses of the 1990s, according to Daratech, Inc. in Cambridge, Mass.

GISs carry *a range of uses, from redistricting to sewer tracking*

The market research firm, which has followed computer graphics technologies for a decade, began tracking the GIS industry more closely last year. By its estimate, worldwide revenues of GIS software companies were $529 million in 1988. That segment of the market is expected to grow by 32% per year through 1993, said Robin Brown, an associate editor at Daratech.

"More and more organizations in private industry are becoming aware that spatially organized data can help them understand and manage their business information more effectively," Brown noted.

What is happening with GIS

Continued on page 30

HP follows competitors in Unix server market

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Introducing its first Unix-based server behind the pack, Hewlett-Packard Co. is set to unveil two models of servers today based on a reduced instruction set computing (RISC) architecture.

Other RISC vendors such as Digital Equipment Corp., Sun Microsystems, Inc., Silicon Graphics, Inc. and Mips Computer Systems, Inc. have introduced similar servers within the last year. DEC's and Silicon Graphics' machines are each based on Mips' architecture.

RISC- and Unix-based servers have become important product offerings in the last year, according to analysts. Basically, vendors take their workstations, add a layer of software, package the hardware in a tower and create a new product.

However, there are vast discrepancies in price/performance with RISC servers. Not counting memory and memory backup, the basic servers now available come from Mips, which offers 12 million to 20 million instructions per second (MIPS) machines at prices ranging from $17,000 to $125,000; the Mips-based Decstation, which runs at 14.3 MIPS for $11,900 to $20,400; the Mips-based Silicon Graphics 4D/25S server, which starts at $12,900; and the Sun Sparcserver 330, which ranges between $28,900 and $42,900 and runs at 16 MIPS.

HP's new servers, based on the firm's 9000 series workstation, are an entry-level machine, the 5-MIPS Model 808S for $21,950, and the 14-MIPS 635SV for $49,000.

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- Denver law firm courts new office system. Page 25.
- HP not letting Apollo fall into the doldrums. Page 28.

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BETA Systems Software, Inc.

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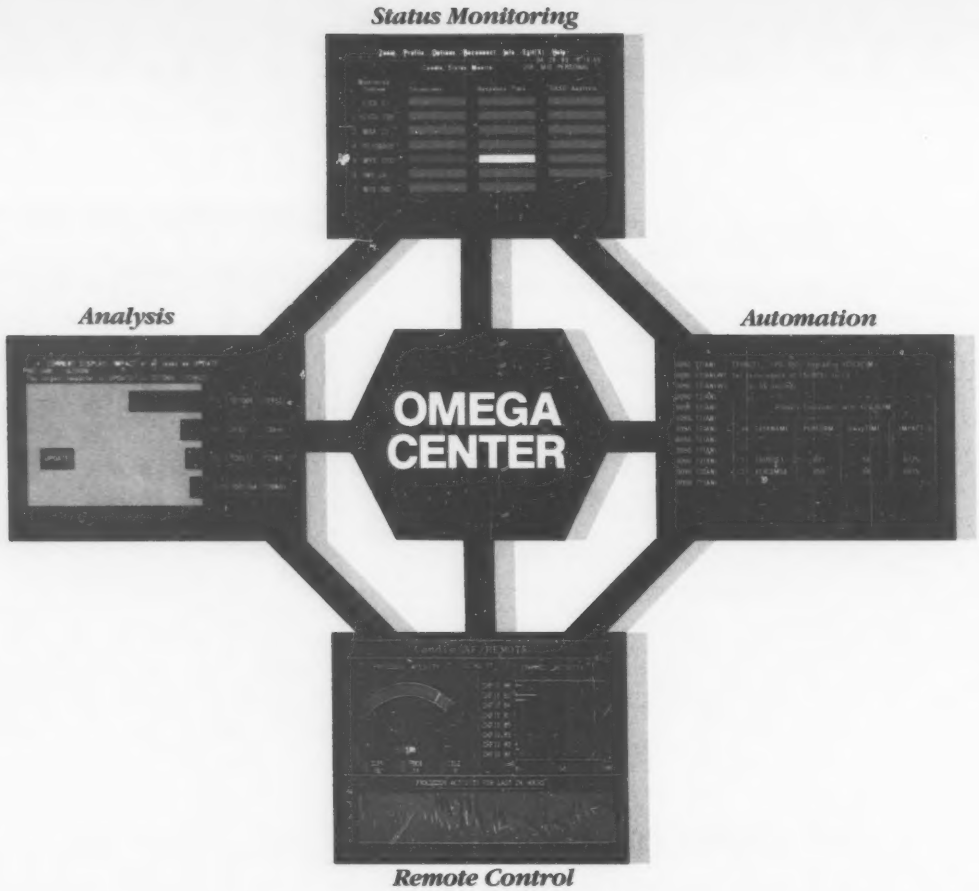

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IBM releases Ramp-C results

ANALYSIS

BY STANLEY GIBSON
CW STAFF

Despite the push to hammer out standard benchmark tests, IBM continues to test its own and rivals' systems under its proprietary Ramp-C benchmark.

In a report on Ramp-C published in June but made generally available two weeks ago, IBM came the closest it has so far to publishing the specifics of Ramp-C, releasing Warnier diagrams of the program. However with the IBM code still not made public, Ramp-C remains impossible to duplicate.

IBM has also tested its own and other vendors' systems under the Debit-Credit benchmark. IBM is a member of the Transaction Processing Performance Council (TPC), which is expected to release a new specification of the Debit-Credit benchmark in September.

Not surprisingly, IBM bested rivals Hewlett-Packard Co. and Digital Equipment Corp. in the Ramp-C test results, which were audited by Arthur Andersen & Co. Ramp-C consists of four types of business transactions, ranging from simple to complex and generated randomly.

The IBM systems tested included several ES/9370 models, 4381 Models 21 and 22 and Application System/400 Models B21 and B60. The DEC systems were the Microvax 3600 under FMS/RMS and the 3600 under ACMS/RMS as well as the VAX 6220. The HP system was the 3000 series 950.

Analyst John Logan, vice-president at the Aberdeen Group in Boston, pointed to journaling as the main cause of the difference in results. Logan explained that journaling usually does not degrade DEC performance to the extent that it does IBM systems. Journaling is typically a requirement for "mission-critical" applications, Logan said. Journaling protects the integrity of the database by writing changes to disk before those changes are made to the database itself.

Journaling had been a notable divergence in previous tests conducted by DEC of both IBM and DEC systems. In the tests DEC conducted earlier — showing IBM systems performing at one third IBM's claims — DEC implemented journaling on both vendors' systems.

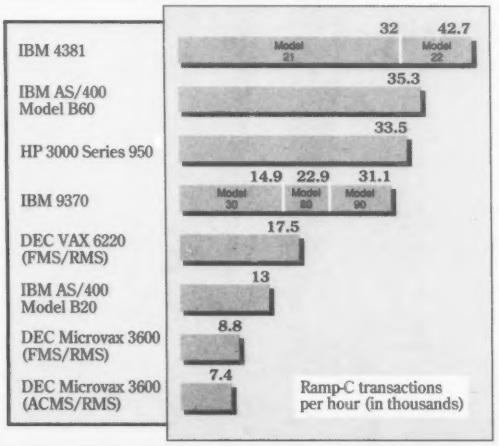
IBM also ran the DEC processors under FMS/RMS and ACMS/RMS while it ran the IBM 370 systems under CICS and VSAM. Logan said a fairer test would have been to run the DEC systems under DEC's DEC-Intact teleprocessing monitor, which he said is analogous to CICS.

IBM and DEC have been going back and forth with rival benchmarks for more than two years. IBM first published results of IBM and DEC systems under Ramp-C. DEC later published the test results of IBM and DEC equipment under the Debit-Credit benchmark. IBM countered with its own audited Debit-Credit results.

Korak Mitra, Hewlett-Packard product line manager, criticized IBM for keeping Ramp-C proprietary. He noted the HP 3000 system was run with HP's Turbo-Image, a network database management system, while the IBM system was run under VSAM, which favored IBM by as much as 30%, Mitra said.

Honing its own edge

IBM claimed performance advantages over DEC and HP using its Ramp C benchmark, but that test remains proprietary



SOURCE: IBM

CW CHART: DOREEN DAHLE

Lawyers' own verdict: It was time for change

ON SITE

BY JAMES DALY
CW STAFF

DENVER — While it is true that the wheels of justice are often painfully slow, they can seem positively high-performance when compared with the time-consuming task of revamping an entire computer setup for 550 employees who are making a federal case out of the old system's inadequacies.

But that is just the task that Gary Harrop was given nearly two years ago when Holland & Hart, a law firm, decided it needed a near-complete system overhaul. "The world seemed to be passing us by," said Harrop, director of administration at the firm. "We saw all these advances developing around the PC and we wanted to take advantage of it."

Sometimes that easily stated goal seemed as far away as Pike's Peak appears when viewed from the firm's office high above downtown Denver. With eight offices spread throughout Colorado, Wyoming, Montana, Idaho and Washington, D.C., Holland & Hart needed a system not only powerful but versatile. That system — now being installed — is the combination of a Data General Corp. minicomputer running a third-party vendor's law-office management package and several local-area networks supporting 300 personal computers.

Like many aging systems, the 11-year-old arrangement produced by Barrister Information Systems Corp. in Buffalo, N.Y., had fallen behind the times. "We were becoming very uncomfortable with it," Harrop said, referring to the assortment of Barrister and Data General Eclipse minicomputers. "The software we ran on it was so proprietary and so old that we often couldn't find temps who could work with it."

Holland & Hart's Harrop *listed software as the No. 1 concern*

Although the project began simply as a way to replace the financial accounting system, before it ended a three-member Holland & Hart team had expanded the scope of the revision to include the entire in-house setup. During the course of the 22-month search, they visited

Continued on page 29

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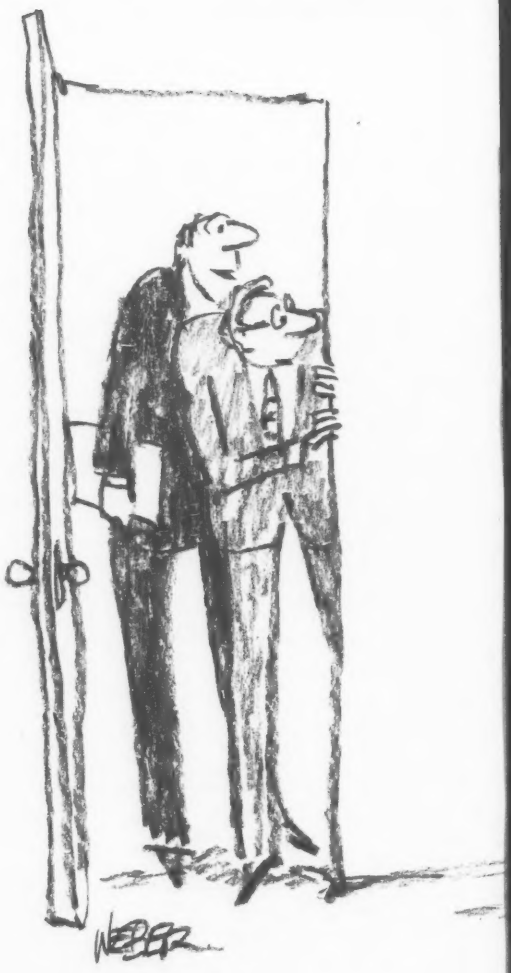

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SOFT NOTES

HP strives to keep Apollo kicking

Hewlett-Packard Co., the new owner of **Apollo Computer, Inc.**, seems intent on not letting its new division languish. The company recently announced a marketing agreement with **Interbase Software Corp.** to supply that firm's Interbase database management system on Apollo Series 10000 personal supercomputers and Apollo Series 3500 and 4500 personal workstations. The Interbase DBMS is currently available for $2,000 to $60,000, depending on the platform.

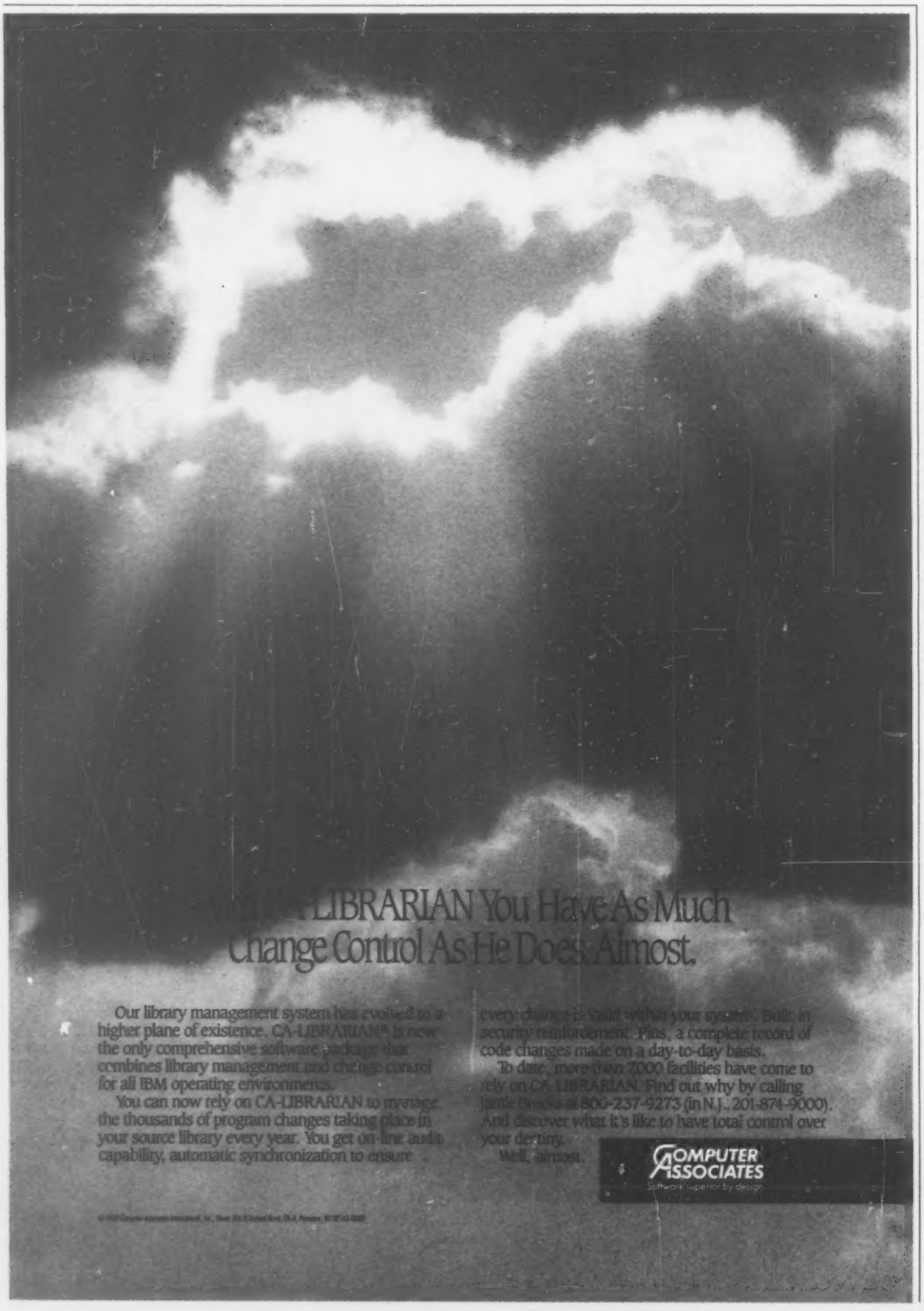
Additionally, HP extended a marketing relationship between **Interleaf, Inc.** and Apollo to market Interleaf's publishing software for Apollo systems. Interleaf's Core TPS is now available from Apollo at introductory prices starting at $1,150 per license.

Relational Technology, Inc. in Alameda, Calif., recently announced that it is porting its Ingres DBMS to the Intel Corp. 80486 computing environment under Unix. RTI is working with **Corollary, Inc.** in Irvine, Calif., under a joint marketing and engineering agreement to optimize Ingres for that company's multiprocessing Unix-based operating system.

Although the 486 version of Ingres reportedly will not be available until early 1990, RTI said preliminary tests have shown significant performance improvements under the multiprocessing personal computer environment over a standard Intel 80386-based PC.

Separately, RTI certified that the Sun Microsystems, Inc. version of Ingres will run on **Solbourne Computer, Inc.**'s Scalable Processor Architecture-compatible workstations without modification.

Additionally, RTI announced a joint marketing agreement with **Unisys Corp.** to sell Ingres on Unisys U series Unix-based systems.



Gibson

FROM PAGE 23

were followed by two of its leanest. The lack of a steady stream of leasing revenue was a likely cause.

With its Aug. 1 announcement of new software prices and leasing rates, IBM let it be known that it wants back into leasing. This time, however, it is leasing software, not hardware. The exorbitant rates for high-end users to purchase software will act as a strong deterrent to purchases, funneling those users toward leases.

Why lease software? It is no secret that IBM believes that sometime in the early 1990s, it will receive most of its revenue from software, not the "Big Blue Iron" that made IBM the industry giant.

Tying the source of more than half of IBM's revenue to purchased goods, which are vulnerable to cyclical purchasing trends, is something that IBM clearly (from its hardware experience) has learned to avoid. So it makes sense that IBM should get as many people onto software leases as it can.

For the user, there appears to be no real downside in all this. IBM will be able to rely on a stable revenue stream to develop enhancements. Although users may be paying more over the long haul, they should be getting more value — in the form of more frequent and better enhancements — in return.

Indeed, the most radical change is that we will need to become used to IBM as a software lessor rather than a hardware vendor. A few years hence, IBM may be faced with one of the most critical crossroads in its history: whether or not to change its name to IBS — International Business Software.

Gibson is *Computerworld's* senior editor, software.

HARD BITS

EMC plays into DEC's hands

EMC Corp. customers buying disk drives for **Digital Equipment Corp.** systems can now get a three-year warranty. The Maxxport series had carried a one-year warranty. EMC says a customer with 10G bytes of storage on a DEC system can save about $80,000 in maintenance costs with this new three-year deal.

Concurrent Computer Corp. and **Sky Computers, Inc.** jointly announced availability of the Sky Warrior-II/C array processor on the Concurrent Series 6000 real-time systems. Sky recently became one of Concurrent's partners in a marketing program.

Sungard Recovery Services and **STM Systems Corp.** signed a deal to provide disaster-recovery services in Canada through a new business unit, STM-Sungard Recovery Services. The two plan to set up a recovery facility in Toronto that will have an operational IBM data center. In addition, the pair will provide personal computer-based contingency planning software and backup capabilities for equipment made by Digital Equipment Corp., Tandem Computers, Inc. and Stratus Computer, Inc.

The Advanced Products Division of **Fujitsu Microelectronics, Inc.** said it signed an agreement with **Interactive Systems Corp.** that calls for Interactive to put an implementation of the Unix operating system on Fujitsu's S-25 Sparc board set. The Unix implementation is a version of the Sun Microsystems, Inc. SunOS operating system.

Sorbus, Inc., a Bell Atlantic Corp. company, said it will now offer an enhanced support program for users of IBM System/34, 36 or 38 midrange systems. The 3Xtra Support program includes a toll-free support hotline, on-site customer support, cold-site disaster-recovery services and a nationwide site relocation and installation service.

Data General Corp. is lining up software suppliers for its Aviion platform, which is based on the Motorola, Inc. 88000 reduced instruction set computing microprocessor. The company announced joint marketing agreements with five database and fourth-generation language vendors, including Relational Technology, Inc., Oracle Corp., Informix Software, Inc., Progress Software Corp. and Cybertek Software, Inc.

Lawyers

CONTINUED FROM PAGE 25

nearly a dozen vendors, ate more airplane food than they cared to admit and at least once had negotiations go sour at the eleventh hour.

The difficulty lay in the fact that Harrop was not prepared for compromises, at least not initially. He not only wanted to preserve select existing applications, but beef up office automation, litigation support, the marketing database system and file room management.

"Software was our most important concern," Harrop said. "We prioritized our software concerns, then figured out what kind of hardware could handle it." Of these, word processing was the most important and the most cast in stone: It was Wordperfect Corp.'s package, or the firm would take its business elsewhere.

The team also did not want to write its own software because it had heard "too many horror stories about firms who've written their own software," said Scott Delmonico, manager of data processing and accounting at the firm.

Holland & Hart's search finally ended up where many firms looking for a revamp eventually go: a third-party supplier. In Holland & Hart's case it was CMS/Data, a Tallahassee, Fla.-based firm that is one of the top five vendors of law-office software in the country.

CMS/Data built the $2.5 million system around DG's Eclipse MV/20000 Model 2 computer, which will not only serve as the host in the Denver office but handle the accounting work that once required four DG machines running Barrister software.

The installation process began May 15 in Cheyenne, Wyo., and is expected to be complete shortly after Thanksgiving. All the sites will be connected by Novell, Inc. Netware coaxial networks. The offices will also have the ability to distribute applications across the network.

The PCs and servers in each branch office will also be linked to the central Denver office through a LAN communications bridge, allowing PC users to access the host system. And there is plenty of room to grow; manager of computer systems Pat Ellenbecker said that less than 3% of the Intel Corp. 80386-based file server's space has been used so far.

Harrop is also hoping to offload much of the work done on the old minicomputers down to the PCs, so the IS team has put together a simplified manual that details only what employees need to get their work done.

With much of the work behind him, Harrop has also been able to take some time vacationing at a cabin in the nearby Rocky Mountains. "The change," he said with a self-satisfied grin, "is as great as the difference between a Model T and the cars we drive today."

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PILOT EXECUTIVE SOFTWARE

Mapping

CONTINUED FROM PAGE 23

today is that the price of technology is going down, and more integrated software is coming together, said Stephen Kinzy, director of marketing for McDonnell Douglas.

"The database technologies, the workstations and their multiuser environments are so much better; it's just exploded the business," Kinzy said.

At their most basic level, GISs capture, manage, analyze and display spatial data. By packaging GIS with relational databases, computer-aided design and engineering software, however, a powerful management tool has emerged.

Business interest in GIS was apparent earlier this month in Boston at the annual conference of the Urban and Regional Information Systems Association (URISA), the oldest organization of GIS enthusiasts. An underlying theme of the four-day gathering was the greater emphasis on information systems — playing up the IS in GIS.

"The URISA conference has gotten a lot slicker," Brown observed. "My impression was of much more business community interest, as opposed to a bunch of people just interested in the technology."

> "MORE organizations in private industry are becoming aware that spatially organized data can help them understand and manage their business information more effectively."
>
> ROBIN BROWN
> DARATECH

Business applications of GIS include demographic market analysis and property and utilities management as well as high-precision engineering applications in oil exploration, hazardous waste analysis and civil engineering.

The technology has been likened to the geographical equivalent of a computerized spreadsheet — a way of marrying computerized data with automated mapping.

"It's clear what direction GIS is moving: toward the dissemination of these systems and implementations from large local governments to small ones," said Connie Blackmon, chairman of the URISA conference and director of data services for the Atlanta Regional Commission.

Yet, despite its potential, GIS faces several imposing hurdles.

Acquiring the data to feed into the database is expensive and time-consuming, requiring aircraft overflights and lengthy digitizing processes.

In Soldatna, for example, McDonnell Douglas and Digital Equipment Corp. sold the city $200,000 worth of GIS hardware and software, but data acquisition cost an additional $1.2 million.

One saving grace for GIS, however, is the increasing availability of inexpensive digital data from government and private sources. The release this summer of the U.S. Census Bureau's Topologically Integrated Geographic Encoding and Referencing, or TIGER, files — a county-by-county map of the entire nation — could have a profound influence on the spread of the technology.

Once a geographic database is in place, a business or government is pretty much stuck with that DBMS' vendor, Brown said. Two cities sharing the same county roads and utility lines can easily end up with incompatible systems, she noted.

Although there is some argument in the industry about the effectiveness of GIS programs on personal computers, many companies are using PC-based mapping programs to graphically display demographic data, proprietary customer profiles and market intelligence.

More vendors are taking advantage of the growing power of MS-DOS-based PCs and Apple Computer, Inc. Macintoshes to develop affordable GIS products for PCs, Brown said.

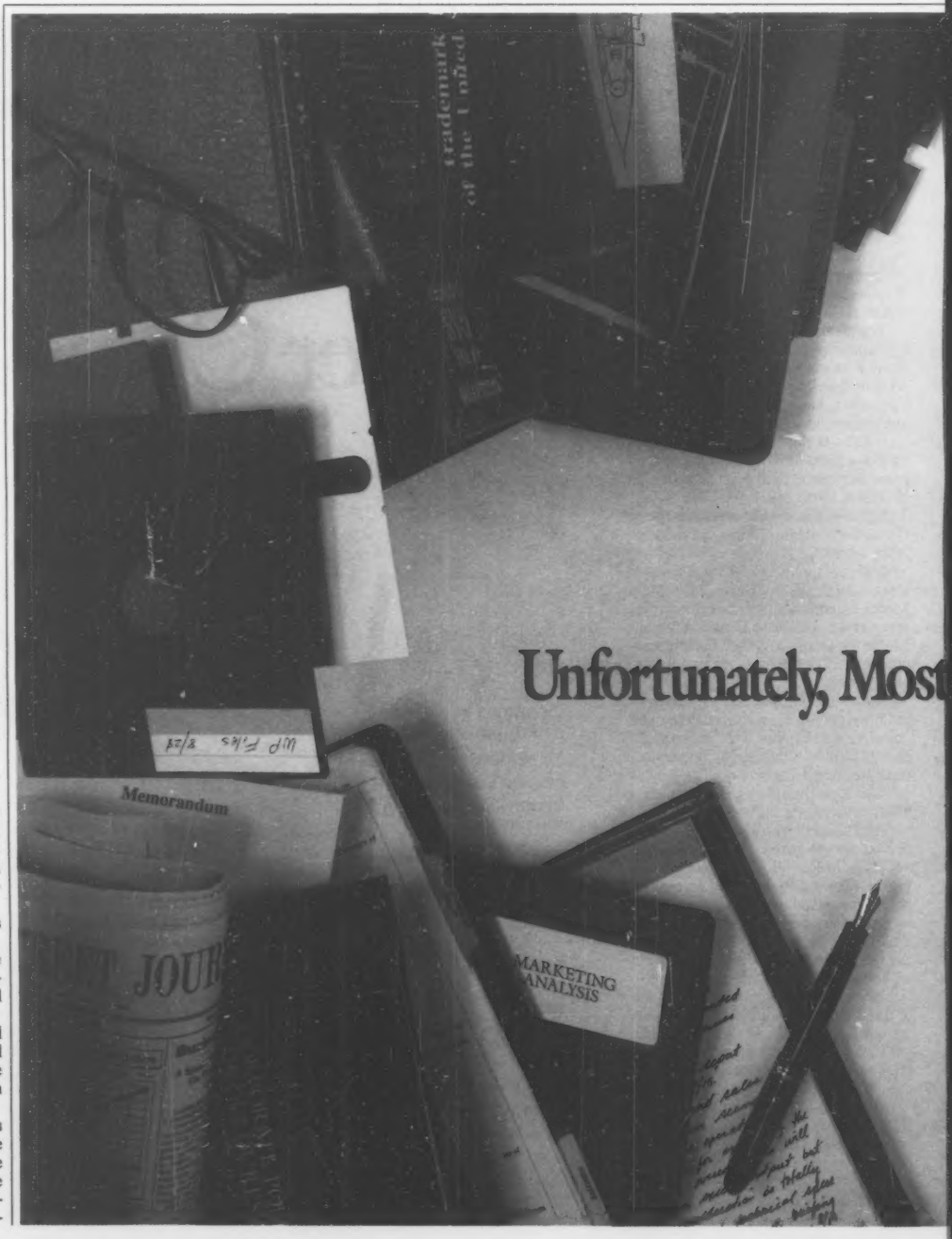
Since the field encompasses so many disciplines, vendors are carving out niche markets in government, manufacturing, utilities and insurance industries. The two top-selling GIS vendors are Environmental Systems Research Institute in Redlands, Calif., with its ARC/Info products, and Intergraph Corp. in Huntsville, Ala., the originators of digital mapping.

Lack of training is the third hurdle for GIS systems. Handing a computer system and software to a group of bureaucrats unfamiliar with the technology can spell disaster for a very expensive undertaking.

"A lot of user organizations not only lack knowledge about GIS but about computer systems in general," Brown pointed out. "For everyone else in local government, technology is pretty foreign, except for word processors."

Still, government markets are especially attractive to GIS vendors. An estimated 80% of the data governments collect is geographic in nature — street addresses, zoning and building permits and police and fire records.

"Revenue generation is a big area of payoff for these systems," said Kinzy, who has worked in the GIS field for 20 years. "Sixty to 70% of taxes gathered by local governments are property taxes — that's all tied to the ground. You do a 5% to 6% better job, and you're talking millions."



NEW PRODUCTS — SYSTEMS

Data storage

Alphatronix, Inc. has introduced a 16.2G-byte configuration for its Inspire erasable optical storage system for Digital Equipment Corp. systems, Sun Microsystem, Inc. workstations and IBM Personal Computer AT-based systems.

Jukebox+ Inspire includes space for 25 5¼-in. cartridges, each capable of holding up to 650M bytes of data. The unit measures 19 by 30 by 21 in. and fits into standard 19-in. racks.

Pricing for the system starts at $49,900.

Alphatronix
P.O. Box 13687
Research Triangle Park, N.C.
27709
919-544-0001

Distributed Logic Corp. (Dilog) has announced a series of small computer systems interface (SCSI) disk-drive subsystems for use with Digital Equipment Corp. Vaxstation and Decstation 3100 systems.

The drives reportedly provide formatted storage capacities of 340M and 638M bytes, offer configuration flexibility, may be packaged in removable mounts and can be plugged into the SCSI port as an external device. According to Dilog, seek times are 10 msec for the 340M-byte drive and 16 msec for the 638M-byte drive.

The 340M-byte drive lists at $5,155; the 638M-byte drive sells for $6,050.

Dilog
1555 S. Sinclair St.
Anaheim, Calif. 92806
714-937-5700

DDC Pertec Corp. has announced a series of tape drives that use the IBM 3480-type tape cartridge.

Called the CS-Series, the drives reportedly use the HI/TC recording format, developed in conjunction with the Working Group for Half-Inch Tape Cartridge Drive Compatibility. Three drive configurations are said to be available with capacities to 1.28G bytes in a 5¼-in. footprint, featuring multitrack serpentine recording format and an embedded small computer systems interface.

In distributor quantities, the 425M-byte Model CS1200 sells for $1,750; the 1.28G-byte two-track serpentine format CS3200 sells for $2,250; and the 1.28G-byte four-track serpentine format CS3400 is priced at $2,500.

DDC Pertec
20400 Plummer St.
Chatsworth, Calif. 91311
818-882-0030

I/O devices

Interface Systems, Inc. has introduced Model 7812-2, a laser printer for IBM 3270 users. It is compatible with the IBM 3812 Pageprinter 2 and is said to produce 12 page/min of letter-quality output with a resolution of 300 by 300 dot/in.

The printer supports IBM's Advanced Function Printing and Intelligent Printer Data Stream, permitting printing of bar codes, graphics, oversized labeling characters and forms-overlay material. Prices begin at $8,925 with the alternative of a 24- or 36-month leasing program.

Interface Systems
5855 Interface Drive
Ann Arbor, Mich. 48103
313-769-5900

Talaris Systems, Inc. has announced an optional add-on for the company's multiuser laser printers.

The Talaris image-processing option, available for the 1590-T and 2492-B Printstations, enables the direct printing of documents that have been compressed in CCITT Group III or Group IV formats, the vendor said. The option is available immediately. The 1590-T version is priced at $1,000, and the 2492-B version costs $1,500.

Talaris Systems
6059 Cornerstone Court W.
San Diego, Calif. 92121
619-587-0787

Storage Technology Corp. has announced a system to enhance printing for its Storagetek 6100 Laser Printer Subsystem.

Called the Print Enhancement System, the product is reportedly a combination of hardware and consumable components designed to improve quality when printing large characters or graphics. According to the company, the system is available only on 6100 Models L26 and L27. Pricing for the 6100 printer is $9,000.

Storage Technology
2270 S. 88th St.
Louisville, Colo. 80028
303-673-5151

A 24-pin seven-color dot matrix printer designed to meet Tempest specifications is available from North Atlantic Industries, Inc.

The P24-T is reportedly capable of producing 360- by 180-pixel resolution reports and graphics. It can function as an 80 char./sec. letter-quality printer, printing 240 char./sec. in draft mode.

According to the company, Courier and Gothic fonts are resident with several other fonts, and many variations are available. The list price is $3,895.

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Hauppauge, N.Y. 11788
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NEW PRODUCTS — SOFTWARE

Development tools

Software Maintenance and Development Systems, Inc. has upgraded its software management system, which is said to provide configuration management and full life-cycle support for development.

Release 7.0 of Aide-De-Camp reportedly supports management of binary and other non-ASCII files and has an import/export capability that allows updating of development groups at different locations. It also offers increased support for parallel development paths, integrated problem management support, automated build procedures and software structural scanning.

Pricing ranges from $3,000 to $35,000, depending on the system configuration.

Software Maintenance and Development Systems
P.O. Box 555
Concord, Mass. 01742
508-369-7398

A software development utilities package designed to automate the management of Intel Corp. 80386-based real-time applications software development has been announced by Alcyon Corp.

The Regulus-386 Tool Kit was developed for real-time systems developers working in the AT&T Unix System V environment, according to the company. Features reportedly include a source-code control system, a Bourne shell command-line interpreter, a C shell command-line interpreter and a spelling checker. The kit sells for $800.

Alcyon
6888 Nancy Ridge Drive
San Diego, Calif. 92121
800-748-5858

Integrity Solutions, Inc. has announced several enhancements to MAX/SPF, the company's TSO/ISPF programmer productivity tool.

The software now offers a data-set name list and a member selection list in addition to full-screen edit and browse capabilities. There is reportedly no limit to the number or length of files that can be processed.

The software is priced from $7,500 to $18,000, depending on CPU model group, and includes one year of maintenance and enhancement coverage.

Integrity Solutions
Suite 200
7921 Southpark Plaza
Littleton, Colo. 80120
303-794-5505

Applications packages

Ansoft Corp. has released Maxwell 3D, a three-dimensional finite-element analysis software package for electromagnetic analysis.

According to the vendor, the software integrates solid-model generation, mesh generation and solution in an interactive menu- and mouse-driven environment.

The program currently supports several hardware platforms, including Apollo Computer, Inc. and Sun Microsystems, Inc. workstations. Hewlett-Packard Co.'s Series 9000 systems under HP-UX can also be supported.

Prices for Maxwell 3D start at $27,000 for a one-year license.

Ansoft
University Technology Development Center
4516 Henry St.
Pittsburgh, Pa. 15213
412-683-4846

Systems Union, Inc. has announced an accounting program designed for multinational organizations.

Sunaccount Fixed Assets is a module of the Sunaccount ledger accounting system. It reportedly aids controllers in recording the acquisition, depreciation and retirement of assets. The software runs on various platforms, including those from IBM and Digital Equipment Corp. It operates on most systems that support AT&T's Unix System V, Microsoft Corp.'s Xenix and IBM's AIX, the vendor said.

Pricing for the Sunaccount Fixed Assets module ranges from $1,400 to $6,125, depending on configuration.

Systems Union
244 E. 48th St.
New York, N.Y. 10017
212-753-7777

Silvar-Lisco has upgraded its full custom editor for the design of integrated circuits.

Princess 2.0 is said to offer the functionality of a graphics editor with on-line interactive design rule checks and extendable macro language. The system runs on equipment from Digital Equipment Corp., Sun Microsystems, Inc. and Apollo Computer, Inc. Pricing for the computer-aided engineering software starts at $30,000.

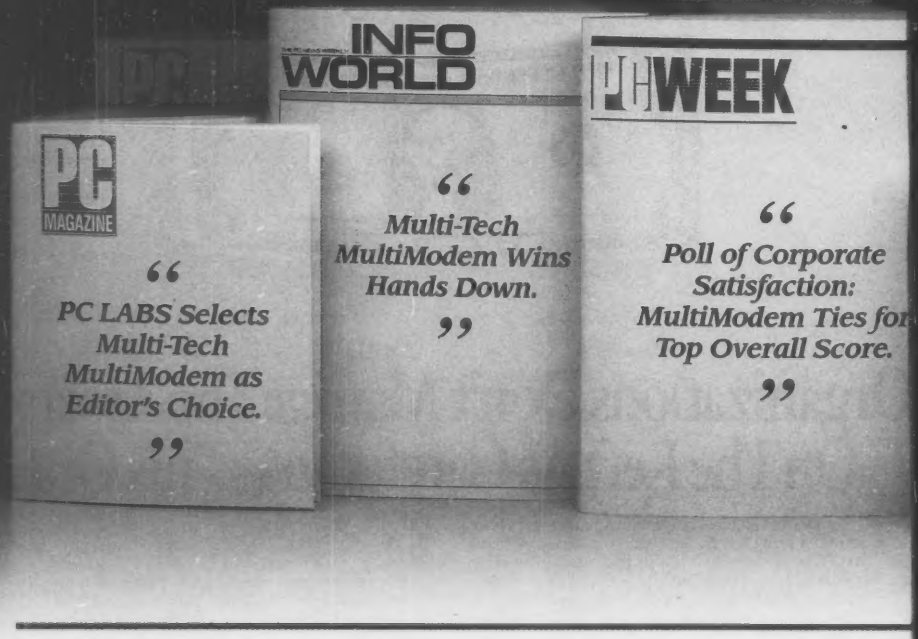
Silvar-Lisco
1080 Marsh Rd.
Menlo Park, Calif. 94025
415-324-0700

Utilities

An IBM MVS utility product designed to automatically end "not catlg-2" and duplicate data-set errors has been announced by Altai Software.

Called Z/CAT2, the software per-

GOOD NEWS



The results are in, and not one, but four of the industry's leading publications name Multi-Tech as the modem of choice.

Magazine editors and corporate buyers alike put nearly every modem on the market under close, demanding scrutiny.

"Solid buy"..."Top performer"..."Slew of extras"... "Well built"..."The price is right"... these are phrases used by reviewers to describe the Multi-Tech MultiModem.

Editors at PC MAGAZINE in a review of 87 modems chose Multi-Tech for their Editor's Choice. Corporate buyers surveyed by PC WEEK gave Multi-Tech their highest scores for quality, overall performance and organized documentation. INFOWORLD, in detailed line impairment testing, named Multi-Tech the unquestionable "top performer." And results of the DATA COMMUNICATIONS Datapro User Review prompted editors to comment, "It's no wonder that Multi-Tech's performance and market share continue to grow."

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forms at the beginning of each MVS job to ensure that data sets are not duplicated in the MVS catalog or on the direct-access storage device, the company said.

The software package is currently available at an introductory price of $5,000.

Altai Software
Suite 150
624 Six Flags Drive
Arlington, Texas 76011
800-227-7774

A set of software programs designed to process the CICS dump data set is now available from International Business Information Systems.

The CICS Dump Buster program consists of three basic facilities: reduction of printed output, reduction or elimination of debugging time and archiving and retrieval of dumps.

The software runs in an IBM MVS environment and may be leased for $350 per year. A perpetual license is available for $1,250.

International Business Information Systems
P.O. Box 15780
New Orleans, La. 70175
504-897-3367

GT Software, Inc. has reportedly enhanced its set of CICS tools with the announcement of Assist/GT Release 2.2.

The software was designed to provide Help screens, tutorials, customized menus and on-line documentation for new and existing CICS applications.

The latest version reportedly includes a pop-up CICS calculator with subtotaling and memory functions and exits for data dictionary access.

The software is available for CICS Release 1.5 and higher, the company said. Permanent license fees begin at $5,500 for VSE and $6,900 for OS/VS operating environments.

GT Software
1111 Cambridge Sq.
Alpharetta, Ga. 30201
404-751-1400

Software Recording Corp. has announced Version 2.0 of Autotester, the company's automated software testing product.

The latest release reportedly supports protocols for IBM System/34, 36 and 38 products and includes a tape management utility. The program also supports applications running in IBM 3270, Hewlett-Packard Co., Tandem Computers, Inc., Digital Equipment Corp., Wang Laboratories, Inc. and Unisys Corp. environments. It is priced from $1,500 to $4,000 per unit.

Software Recording
Suite 122
6060 N. Central Expwy.
Dallas, Texas 75206
214-368-1196

Computer-aided software engineering

Netron, Inc. has updated its software engineering systems for six microcomputer, minicomputer and mainframe development platforms and the DOS/VSE mainframe batch production environment.

Version 2.04 of Netron/Cap is available for native and portable Cobol application development on IBM Personal Computers, Personal System/2s and MVS and VM/CMS mainframes; Digital Equipment Corp. VAX minicomputers; and Wang Laboratories, Inc. minis.

Features include new testing and maintenance features, increased flexibility for PC-based mainframe development and an optimized frame implementation of Micro Focus Cobol/2, IBM's Systems Application Architecture compiler. Licenses range from $50,000 to $600,000.

Netron
99 St. Regis Crescent N.
Toronto, Ont., Canada M3J1Y9
416-636-8333

An upgraded computer-aided software engineering product has been announced by Cadre Technologies, Inc.

Release 3.1 of Teamwork reportedly stresses object-oriented analysis and design technology, generates requirements traceability matrices for aerospace and defense-related users, includes documentation templates, supports Ada and uses SQL.

According to the company, Teamwork will be available on workstations such as those from Digital Equipment Corp., Sun Microsystems, Inc. and IBM.

The new release will be shipped free of charge to all current Teamwork maintenance subscribers.

Cadre Technologies
222 Richmond St.
Providence, R.I. 02903
401-351-2273

A program that aids organizations in evaluating the benefits of computer-aided software engineering (CASE) technology has been introduced by Index Technology Corp.

The CASE Project Pack reportedly guides organizations through the CASE implementation process without requiring a full-scale investment in CASE.

The software includes rental of Index Technology's Excelerator systems analysis and design software.

It is provided with consulting, training and support services, according to the company.

Pricing ranges from $20,000 to $65,000, depending on the size of the individual project.

Index Technology
1 Main St.
Cambridge, Mass. 02142
617-494-8200

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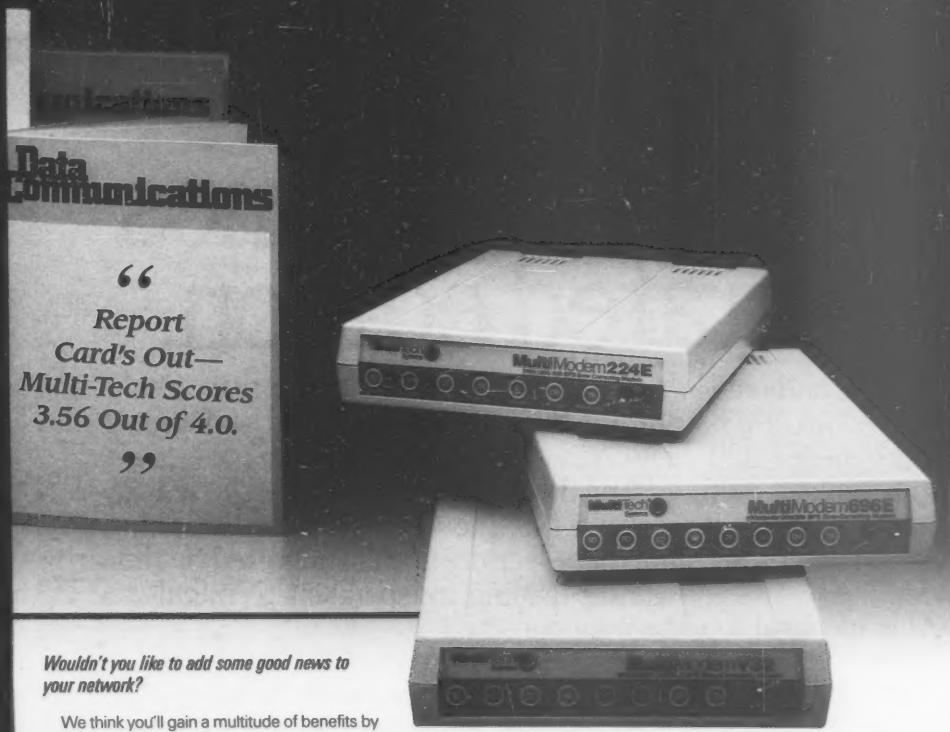

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MICRO BITS

Patricia Keefe

Whine with your tort?

Reason is returning to this rabidly sue-happy industry, with IBM leading the way. And none too soon, thank God.

I was beginning to get really worried. The way I see it, the real reason behind the slumping earnings, better-late-than-never products and buggy initial releases plaguing the computer industry is that vendors and developers have been too busy bullying one another with legal tactics. It's a wonder anyone can find the time to work, never mind innovate.

OK, so maybe that theory is a little too simplistic. But it has gotten to the point where the industry is so evenly divided among competing standards groups, suers, suees and the just nervously watching that the inevitable has happened. There's

Continued on page 40

Inside

- Peace Corps sends Macs worldwide. Page 37.
- Microsoft upgrades Mail network. Page 40.
- Sun workstation base slated to erode. Page 44.

PCs speed AIDS research

BY MICHAEL ALEXANDER
CW STAFF

It is easy to think of personal computers as primarily useful for processing words or calculating spreadsheets, but at Burroughs Wellcome Co., they are also being used to save lives.

The Research Triangle Park, N.C., pharmaceutical company is the developer of AZT, a drug proven — after exhaustive research by the U.S. Food and Drug Administration — to slow progression of the acquired immune deficiency syndrome virus.

At a press conference two weeks ago, the FDA said the drug offers hope for the millions of people worldwide who are infected with the AIDS virus. The FDA's tests indicated that AZT was able to slow the disease in people with mild AIDS symptoms, a group that numbers 100,000 to 200,000 in the U.S.

Before the drug could be tested and approved by the FDA, it had to pass rigorous clinical trials by the company. The test data had to be entered into a network of IBM Personal Computers by the clinical data processing department at Burroughs Wellcome and uploaded to a host.

The department operates a Token-Ring network of 80 IBM PCs with a Personal System/2 Model 80 as a file server, which was installed two years ago. The department had previously used Northern Telecom, Inc. 585 controllers and software for data entry. However, when Northern Telecom said that it would discontinue the product line, the department decided that the time had come for a mainframe link based entirely on micros, said Judy Auld, who heads up the systems support section. "Not only would such a network be easy to expand and upgrade, but it would make us compatible with the rest of the company. A real issue was what software package we should use for data entry," she said.

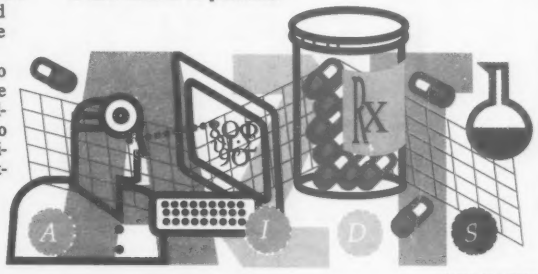
A task force of IS personnel and end users set out to find a software package that would mesh with program development efforts going on in other areas of the company. Requirements were broken into categories, including program development, data entry, entry verification, host access, system support and cost.

Nearly two years after the search began, the department selected Entrypoint 90 from Datalex in San Francisco. The program is used by other pharmaceutical firms, Auld said.

The depth of support was particularly important, as was the vendor's willingness to tailor the software to the company's unique requirements, Auld said.

"The kind of entry we do is very different from that in some companies," Auld pointed out. "Their operators may key data to the same screens over and over again. The interface is constant. With clinical data, we create a separate entry program for each study. The forms may be three to 200 pages long, with 70 unique pages per application. This means we need an application language that can turn out programs quickly; we don't have lots of time to put them together." She said the language has to be friendly to a novice programmer, yet powerful enough so that an experienced person can exploit its capabilities.

To winnow the list of software packages, the task force devised a test case based on the many tasks involved in a typical application. Programs were evaluated on such criteria as development time, archiving features and formatting capabilities.



DAVID FLAHERTY

Influence wanes for 'safe' IBM

BY MICHAEL ALEXANDER
CW STAFF

Nobody ever got fired for buying IBM products, goes the old saw, but there may be less security for those who pick IBM in the future. That's the upshot of a recent report by Forrester Research, Inc. in Cambridge, Mass.

The firm, which completed a survey of 100 computer buyers in Fortune 1,000 accounts, said its poll indicated IBM's ability to control the computer industry is waning. The market has become too dispersed for IBM to control at the level it did in the 1970s and early 1980s, said author John C. McCarthy, director of professional systems research.

The best example of IBM's decreasing ability to direct the market is the poor acceptance of Micro Channel Architecture (MCA), McCarthy said. As IBM's role as high-technology trendsetter erodes, so does its ability to go off on proprietary tangents, he said.

IBM will no longer be a "safe" bet, while those firms that follow blindly will be left to pay monopoly prices, the report concluded. It added that only 20 of the 100 respondents have standardized on MCA-based personal computers, although Storeboard, Inc. claims MCA-based systems are now among the most popular in the industry (see story page 37).

Some folks think that COBOL, the language of the past, may also be the language of the future!

"Micro Focus COBOL for Presentation Manager has suddenly become the right language." . . . . . **BYTEweek, 6/19/89**

"And COBOL, the language everybody uses without admitting to it - also refuses to go gentle into the night of old technology. . . Micro Focus appears ready to bring the old-time language into the brave new world of graphical user interfaces." . . . . . **PCWeek, 6/5/89**

Micro Focus COBOL/2 Workbench Awarded 1989 Professional Solutions Award . . . . . **PC Tech Journal, 2/89**

"The COBOL/2 Workbench, available from Palo Alto based Micro Focus, Inc. is by far the most powerful and complete PC-based COBOL development and maintenance toolset. This package is the Cadillac of PC COBOL toolsets." . . . . . **System Builder Magazine, 1/89**

Micro Focus "ANIMATOR is a sparkling example of the reason why the PC-based COBOL workstation represents a quantum leap in programmer productivity." . . . . . **Database Programming & Design, 10/88**

"Could COBOL be the key to the success of OS/2?" . . **BYTEweek , 6/19/89**

Micro Focus Awarded Four Out of Four Ribbons for "Overall Value" in Readers' Choice Awards . . . . . **InformationWEEK, 4/24/89**

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23. Dir., Mgr., Supv., Analyst, of Systems
31. Dir., Mgr., Supv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supv., OA/WP
38. Data Comm. Network/Systems Mgt.

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
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23. Dir., Mgr., Supv., Analyst, of Systems
31. Dir., Mgr., Supv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supv., OA/WP
38. Data Comm. Network/Systems Mgt.

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12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales/Mktg. Mgt.

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Peace Corps sends Macs to foreign posts

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — In the next few weeks, 34 Macintosh SE computers donated by Apple Computer, Inc. will be shipped or hand-carried to some of the most remote sites in the world by U.S. Peace Corps volunteers.

For example, one Mac with associated software is expected to land in Mali, a drought-stricken country in Africa with very weak food-supply systems. Hilary Whittaker, the Peace Corps director in Bamaka, Mali, plans to develop a database of reports on agricultural development needs and successful programs in each region of the country.

Microcomputers will help Peace Corps volunteers to handle a variety of record-keeping chores more efficiently, said Susan Coates, management information specialist for the Peace Corps' international operations office in Washington, D.C.

While agricultural projects will use the Macs to track harvests and growing conditions, educational projects will use the Macs to produce training pamphlets, handouts, quizzes and other literature that is in very short supply in developing countries. The most promising applications are in small-business development, agricultural programs, educational publications, health records and urban planning, Coates said.

Since Peace Corps volunteers usually serve for a two-year term, a microcomputer database will provide a historical record that shows newcomers what development strategies have worked in the past, she added.

In Ecuador, the Peace Corps is helping artisans who weave colorful textile products — such as tapestries, sweaters and blankets — to set up a storefront shop in the capital city of Quito for exporting goods to foreign markets. Elizabeth Taska, a Peace Corps volunteer, said she will be hand-carrying a Mac to Quito to manage the financial affairs of the exporting business.

Macs mean *a new way of doing business for Ecuador artisans*

"It will be giving them an advantage that they would never have otherwise to make their organization a little bit more professional . . . and competitive on an international level," Taska said.

Generally, the Macs will be installed at Peace Corps offices in the capital cities of the countries involved, where a reliable supply of electricity is more likely to be found, Coates said.

Apple's donation — 34 Macs for the field and one for headquarters to administer the program — was valued at $216,000. The donated software packages included Microsoft Corp.'s Works and Claris Corp.'s MacDraw II and MacPaint II.

Coates said that Apple approached the Peace Corps in 1988 about the possibility of making a gift if a need for Apple micros could be demonstrated. The Peace Corps then surveyed its field offices and found enthusiasm from many volunteers, who predicted the personal computers will be in use six to eight hours per day.

"The exciting part is that this donation will directly affect the quality of the volunteers' work in the field," Coates said.

Eventually, the Peace Corps hopes to find a low-cost international network service that will allow the Mac users to transmit reports to the agency's mainframe in Washington, D.C., she said.

Micro Channel machines still in high demand, report says

BY PATRICIA KEEFE
CW STAFF

IBM's competitors may need to do a better job of keeping their ears to the ground. June retail sales figures belie the oft-stated position of rival personal computer suppliers who insist there is no demand for IBM's Micro Channel Architecture (MCA).

Contradicting those claims by IBM rivals, Storeboard, Inc., which tracks computer-related sales through retail channels, recently reported that in both the Intel Corp. 80286 and 386 market segments, MCA machines are the top sellers.

Vendors such as Compaq Computer Corp. and NEC Information Systems, Inc. have said they will provide MCA-based alternatives to IBM's Personal System/2 line if demand picks up. "If customers want Micro Channel products, I would be foolish or crazy to say that we would not give them what they want," said Mike Swavely, Compaq's president of North American region, in a July interview [CW, July 17].

In fact, since at least April, IBM has topped its fiercest rival, Compaq, in both market segments. "IBM introduced the

Continued on page 44

Tandon cuts prices, product line

BY PATRICIA KEEFE
CW STAFF

MOORPARK, Calif. — Tandon Computer Corp. streamlined and cut prices on its product line recently to stimulate sales, phasing out five computer models.

Internal cost-cutting measures have slashed operating expenses by 75% and lead to the consolidation of Tandon's U.S. sales and marketing operations under one roof. Since the reorganization, which was completed in July, Tandon claimed that its revenue has increased 20%.

In addition to reducing overhead, Tandon said it is working to increase manufacturing efficiency and improve the feature sets of its systems.

By adding value such as a proprietary expanded memory to its systems, the vendor said it has been able to offer products to dealers at a reduced price while also lowering the suggested retail price.

For example, pricing for Tandon's family of Intel Corp. 80386-based microcomputers now ranges from $2,299 to $4,899. Tandon also reduced the sticker price on all of its memory add-ons, as well as Xenix and Novell, Inc. drivers for Tandon's Personal Data Pac.

These reductions are supplemented by a new credit plan said to extend interest-free 30-, 60- or even 90-day financing to qualified resellers.

Streamlining efforts will phase out the following models: the PCA (8- and 10-MHz models), the PCA Plus, the PAC 286 Plus and the Tandon 386/16. A limited inventory of these models will be held in reserve to fulfill outstanding bids, prior customer commitments and ongoing contracts, Tandon said.

Although the existing product line has been pared down, Tandon noted it has added several models.

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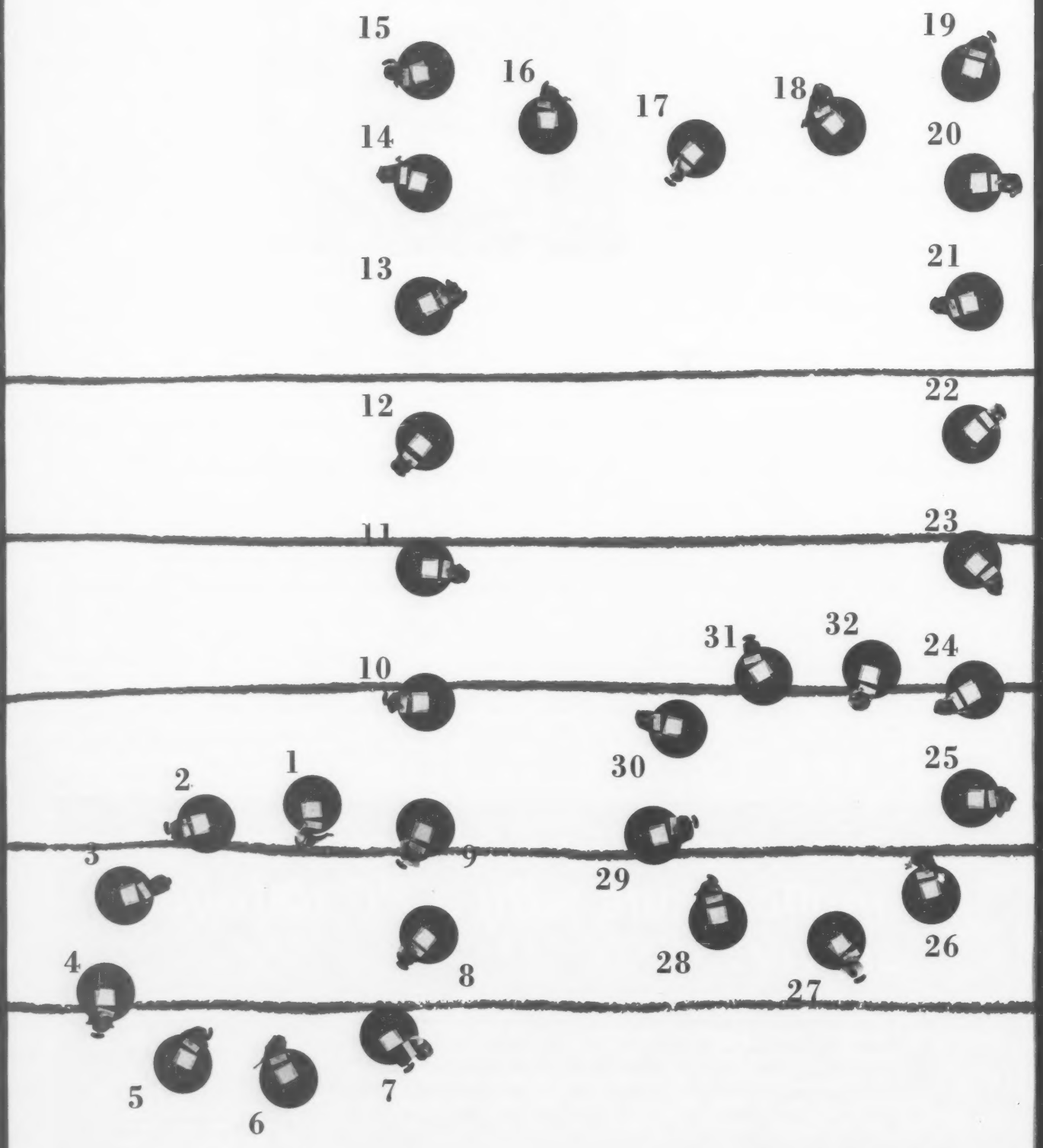
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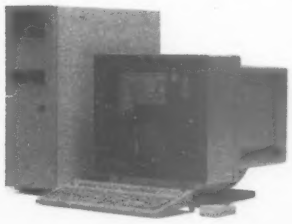

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So if you've been waiting to hear about the right file-serving system at the right price, contact your IBM marketing representative or IBM Business Partner or call 1 800 IBM-2468, ext. 149 to learn more about the IBM RT system.

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IBM

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Keefe

FROM PAGE 35

simply no one left of consequence to spit at, step on or hassle in the computer trenches.

But heck, that's never stopped anyone spoiling for a good fight. If you're still left standing after cleaning out one bar, you just strut on down the street and barrel into another. You don't mess with Texas, or IBM for that matter.

Let's face it: Lawsuits are a good way to give people who are especially fond of custom-made suits an excuse to show them off. Suits are a good way to stop competitor's innovations, especially if *you're* king of the hill and *they're* not.

After a protracted legal battle, even if you lose, you win. A smaller opponent might find itself both financially exhausted and seriously off its product delivery schedule after throwing everything into a well-greased legal juggernaut.

Sound like fun? But you've got no competitors to needle? No legitimate gripes to air? Take a tip from IBM and expand your horizons. Lawsuits can also be used to terrorize the riffraff.

Fearless as ever, IBM has taken to the tort several times this year to protect itself from the onslaught of at least two marauders — a computer products distributor and a small winery run by an ex-IBMer with a sense of humor. (So you know there's at least one.)

For example, the industry's benevolent monolith saw fit to send cease-and-desist letters to distributor Big Blue Products, Inc., demanding it find shelter under another name.

Now, in your wildest dreams, can you imagine International Business Machines Corp. *ever* forsaking its bold acronym for "Big Blue?" Genrad is a prominent example of a firm that was so taken with its nickname that it took legal steps to dump its original moniker (General Radio Corp.) But IBM? Nah.

Can you remember IBM ever officially (or otherwise) referring to itself as Big Blue? Improbable. And do you think that anyone will confuse IBM with either a tiny computer distributorship or a pint-size bottler of regional wine? Not a chance. I mean, let's visualize for a moment John Akers or Terry Lautenbach baring their pinstriped legs to stomp grapes in a basement somewhere in Armonk. Pretty hairy, eh?

But I guess there's some hope that common sense will rise to the top. Just as I was about to suggest IBM borrow a page from a different Apple — the recording people — and resolve to cut deals with would-be proprietors of Big Blue merchandise, they did — sort of. IBM had the good grace, not to mention goodwill, to announce earlier this month that it will no longer hassle users of the "Big Blue" handle.

Don't applaud too loudly, though. As it turns out, our buddies in blue and all their lawyers have not yet managed to pull off a requisite legal maneuver. They've failed twice to trademark Big Blue in the Patent and Trademark Office. So far, this has been attributed to technicalities such as incorrect dates and signatures, which is not the kind of screwup you'd expect from big guns on retainer.

Now if two idiotic goofs were really the reason IBM has been denied by the patent office, a third carefully proofed patent attempt would probably do the trick. So that's probably not the reason why IBM retracted its claws. Meanwhile, there's no wonder the courts are so clogged. Big Blue? Hah. Big Bully sounds more like it.

Keefe is a *Computerworld* senior editor, PCs and workstations.

Microsoft announces an E-mail upgrade for Apple

BY PATRICIA KEEFE
CW STAFF

BELLEVUE, Wash. — Microsoft Corp. recently rolled out an upgraded version of Microsoft Mail that enables the electronic mail program for Apple Computer, Inc.'s Appletalk, Tokentalk or compatible networks to exchange messages between various networked environments.

Users can now take advantage of multiple server support based on a store-and-forward engine, a global replicated directory that will share the same user list across several servers, network administration tools, custom forms capability and gateway services into Unix, IBM and Digital Equipment Corp. systems, said Jeff Raikes, general manager of Microsoft's office business unit.

DEC VAX support will provide a mail server for large numbers of Macintosh users. The directory will enable system managers to update the global listing of user names on all servers simultaneously.

The enhanced mail system is now integrated with Microsoft Word 4.0 and Excel 2.2, and Raikes indicated that he is talking with such third parties as Symantec, Inc. and Claris Corp. about integrating Mail with their applications.

Personal computer client support requires a network adapter supporting Appletalk protocols. Raikes said there will be a PC server for Appletalk networks. "The real opportunity is in PC business mail" as the PC world shifts from a character to a graphics emphasis, he said.

Raikes said an OS/2 server-level product "is a likely intention" but emphasized that he is not announcing such a product.

Suggested pricing for Mail 2.0 ranges from $125 for a PC or Apple Macintosh workstation, $395 for a server and $1,495 for a Macintosh Workstation 20 Pack. A number of third parties announced gateway and/or server support for X.400, MCI Communications Corp.'s MCI Mail, Unix Mail, IBM's Professional Office System and Distributed Office Support System, DEC's VMS Mail and All-In-1.

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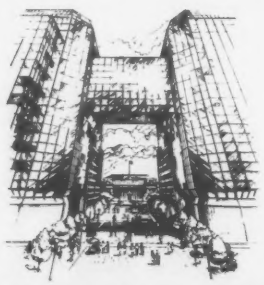

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Vendors vie for Sun's reign

BY RICHARD PASTORE
CW STAFF

Though Sun Microsystems, Inc. continues to reign as the king of workstations, it will likely start losing market share to rivals beginning in 1990. Sun actually should relinquish the lead in shipment volume to Digital Equipment Corp. and IBM in 1991-92, according to a recent study by International Data Corp., a Framingham, Mass.-based research firm.

The worldwide workstation market value was $4.5 billion last year, up 71% from 1987, and Sun claimed one-third of that market, the study reported. The company also leads in units shipped and installed base with 37% and 33%, respectively.

However, DEC is coming up fast. Last year, DEC displaced Apollo Computer, Inc. — now a division of Hewlett-Packard Co. — as No. 2 in units shipped, with 22.4% of the market.

The study predicted that on the strength of its Vaxstation and Decstation shipments, DEC will gain share through 1989 and beyond partly at Sun's expense and that it will eventually become the leader in shipment volume.

IBM, now just a petty fiefdom in the workstation kingdom with 2.2% of the installed base, could become a first-tier player after 1991 and join DEC to share the lead in worldwide shipment volume. The scenario hinges on IBM introducing a blockbuster replacement for its unspectacular RT workstation next month, something study author Vicki Brown said she expects. If so, it will take 18 months before the rollout makes an impact, she said.

Though the Apollo merger will give HP a bigger presence in the market, the study projected that user concern about which product lines might be dropped will curtail short-term growth for the team. Apollo and HP independently rounded out the Big 4 in the shipment market last year, with shares of 15.6% and 13.1%, respectively.

Before System 1032, 24 years and 1 trillion bits of interplanetary data were lost in space.

When the recently launched Magellan space probe reaches Venus in the summer of 1990 to map the planet's surface, it will collect more than 1 trillion bits of data. That's more information than gathered from all the previous planetary probes combined.

According to Dr. Raymond Arvidson of Washington University in St. Louis, the successful use of this new data all gets down to System 1032 from CompuServe Data Technologies.

"Our System 1032 database is the only one in the world that does what it does," said Professor Arvidson.

As Arvidson discovered, System 1032 4GL/RDBMS software readily handles his record-breaking amounts of data at record-breaking speeds. Smoothly. Easily.

Along with the team from the Department of Earth and Planetary Sciences, Arvidson uses System 1032 to catalog and access vast amounts of digital data from past and present missions. Currently, the database includes information about 150,000 images and 500,000 photoproducts.

Before System 1032, 24 years of data weren't cataloged or readily accessible. So trying to find a particular image could not only take weeks, it might not be found at all.

Using System 1032's browse capability, the database can be easily searched and data quickly displayed. For example, a data search that might have taken 40 hours before System 1032, can now be done in just seconds.

If your large, sophisticated RDBMS application leaves you lost in space, here's how to find the answer: Think Big. Think Fast. Think System 1032 from CompuServe Data Technologies.

CompuServe
Data Technologies

1000 Massachusetts Avenue
Cambridge, MA 02138

1-800-USE-1032 Ext. 500
8-6 P.M. EST

Think Big. Think Fast.
Think System 1032.

IBM PCs get art magic

BY RICHARD PASTORE
CW STAFF

IBM Personal Computer users have a new bit of artistic hocus-pocus to add to their bag of tricks — Adobe Streamline from Adobe Systems, Inc.

Adobe Streamline-Windows Version, announced last week, allows users to trace bitmapped images automatically and transform them into Adobe Postscript-quality artwork that can be used as is or modified by popular drawing programs such as Adobe Illustrator-Windows Version and Micrografx, Inc.'s Designer.

"Businesses have recognized that graphics communicate," said David Pratt, general manager of Adobe's application products division. PC users can now easily include high-quality artwork in their presentations, he said.

The product's tracing technology detects the edge of filled areas and a line's center. The program automatically layers objects so that users can more easily manipulate the artwork's segments.

Since Adobe Streamline produces compact Postscript language files, the artwork produced can take up to 90% less system memory than the original bitmapped image, the Mountain View, Calif.-based company claimed.

The product requires an Intel Corp. 80286 or 80386-based PC or compatible with 640K bytes of memory. Adobe recommends that users who plan to work with large or complex images have at least 2M bytes of memory available. It is slated for availability by the end of next month and will retail for $395.

MCA

FROM PAGE 37

Model 50Z in June 1988. It overtook Compaq to become No. 1 in terms of sales around December 1988," said Storeboard President JoeAnn Stahel.

She laid out the following figures, comparing specific IBM model sales to total Compaq sales:

- In the 286 market: In April, 107,000 units were sold overall, with IBM's PS/2 Model 50Z garnering a 40.2% share and total Compaq sales grabbing 19.4%. In June, sales jumped to 114,000 units. The Model 50Z's share slipped a bit to 36%, while Compaq's edged up to 22.2%. Storeboard said IBM's June introduction of its 386SX box undercut its 286 sales.
- In the 386 market: In April, 38,955 units were sold. IBM's 20-MHz PS/2 Model 70 rang up 38.4% of that total, while Compaq tallied 27.6%. Total unit sales increased to 42,401 in June, with the Model 70 dropping to 34.7%. Compaq stayed fairly even, recording 27.2%.

IBM is particularly pleased with these numbers, since Storeboard only counts sales through retail distribution, while IBM sells through multiple channels. Compaq sells only through retail.

IBM is also beaming over its 386SX sales. Compaq clearly leads here with 60% of sales. However, IBM's two-month-old Model 55SX has rocketed from zero retail market share to 30%.

NEW PRODUCTS

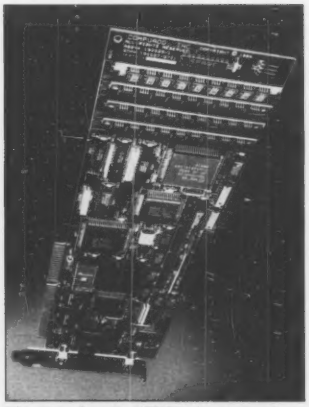
Board-level devices

IBM has announced a memory expansion card that uses 4M-bit chip technology for use with IBM's Personal System/2.

The PS/2 Enhanced 80386 Memory Option is said to be initially configured with either 2M or 4M bytes of memory and can accommodate three additional 1M-, 2M- or 4M-byte memory modules. According to IBM, the 4M-bit chip can store the equivalent of 400 pages of double-spaced typewritten text and can access data in 80 nsec.

The 2M-byte card is available immediately for $1,795. Available in limited quantity in 1989, with general availability in first-quarter 1990, the 4M-byte card and modules are priced at $3,495 and $3,095, respectively.

IBM
1133 Westchester Ave.
White Plains, N.Y. 10604
914-642-5363



The Hardcache/ESDI *circuit card*

Compuadd Corp. has introduced Compuadd Hardcache/ESDI, an electronic circuit card that reportedly improves the performance of complex personal computer applications.

The card combines an intelligent disk controller with up to 4M bytes of cache memory, the company said. The product supports up to two enhanced system device interface (ESDI) hard disks and up to two floppy disks, with no need for traditional controllers.

Pricing ranges from $495 with 256K bytes of memory to $1,760 with 4M bytes of memory.

Compuadd
12303 Technology Blvd.
Austin, Texas 78727
512-250-1489

Hercules Computer Technology, Inc. has released the Hercules VGA Card, the latest addition to its family of video enhancement cards for the IBM Personal Computer and compatibles market.

The card reportedly offers full register-level compatibility with IBM's Video Graphics Array board, and operates in an IBM PC, XT, AT or Personal System/2 Model 30. All modes of the product are supported on standard fixed-frequency analog monitors via a single 15-pin video output, according to the vendor.

The Hercules VGA Card sells for $299.

Hercules Computer Technology
921 Parker St.
Berkeley, Calif. 94710
415-540-6621

Software applications packages

NEC Home Electronics, Inc. is making available a read-only memory (ROM) card version of Lotus Development Corp. software for the NEC Ultralite laptop computer.

According to the company, NEC is manufacturing ROM versions of Lotus' 1-2-3 Release 2.01, spreadsheet software; Agenda Release 1.0, personal information management software; Metro Release 1.1, a PC desktop manager; and Express Release 1.0, a PC communications package for MCI Mail.

Available as of July, Lotus' 1-2-3 costs $495; Agenda for the Ultralite is $395 and will be out in the third quarter. A card containing both Metro and Express lists at $235 and will also be available in the third quarter.

NEC Home Electronics
1255 Michael Drive
Wood Dale, Ill. 60191
312-860-9500

Abacus Consulting has produced a computer program that allows users to load medical reference files into a database for access.

Called Medmate, the menu-driven program can reportedly be used as a diagnostic tool by searching the files for symptoms or tests and by providing a differential diagnosis. According to the vendor, the program was developed with practicing physicians at the LAC-USC Medical Center and can be used as an aid in treatment and to print custom reports.

Medmate requires an IBM Personal Computer or compatible minicomputer with hard disk and 270K bytes of available memory. Its introductory price is $99.

Abacus Consulting
P.O. Box 3488
South Pasadena, Calif 91031
818-799-1477

CSE Corp. has introduced Protool, a three-dimensional design and two-dimensional drafting package for the IBM Personal Computer AT or compatibles.

The menu-driven package reportedly provides solid modeling capabilities. Designs can be viewed from 18 viewpoints, and any view can be displayed in a wire frame with background lines removed or shaded, the company said.

Requirements are said to include 512K bytes of random-access memory and a 5M-byte hard disk. The price of $1,900 includes manuals, three-dimensional axis model, function key templates, one year of free updates and phone support.

CSE
600 Seco Road
Monroeville, Pa. 15146
412-856-9200

Systems

Summit Software Corp. has introduced a filing and archive system consisting of hardware components, a relational database and operating software.

The Laser-Base Filing System reportedly consists of a supermicrocomputer with a high-capacity hard disk, one or two optical disk drives, a digital scanner, a high-resolution monitor, a laser printer and the relational database and operating software. Other options are said to include facsimile communications and multidisk jukebox hardware.

Prices start from about $40,000, depending on options.

Summit Software
Suite N-202
430 Tenth St. NW
Atlanta, Ga. 30318
404-888-0700

Training

Logical Operations, Inc. has announced training for Lotus Development Corp.'s 1-2-3 Release 3.0 and Version 2.2.

Release 3.0 materials have been available since June; Version 2.2 courseware will be available after the software is released later this year, the vendor said. Pricing for a starter package which includes both courses is $1,500, with the Version 2.2 portion to be shipped when available later this year, the company said.

Logical Operations
595 Blossom Road
Rochester, N.Y. 14610
7116-482-7700

Fliptrack Learning Systems has announced that its Advanced Training for the Wordperfect 5.0 tutorial product is now available on audio cassettes.

The audio-based course was designed for users of Wordperfect Corp.'s word processing package and reportedly provides in-depth instruction for creating macros, creating merges, sorting records and customizing commands. The course includes four audio cassettes, a data disk and a reference guide. The price is $99.

Fliptrack Learning Systems
Suite 200
999 Main St.
Glen Ellyn, Ill. 60137
800-222-3547

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BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. **DOS** and **OS.**
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. **DOS** and **OS.**
BIM-FMAP — CICS BMS on-line map generation and maintenance. **DOS** and **OS.**
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration. **DOS** and **OS.**
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Software utilities

Inset Systems, Inc. has introduced a conversion package that reportedly produces Adobe Systems, Inc. Postscript-quality documents transmitted with a facsimile card.

According to the vendor, Hijaak PS accepts Adobe Postscript output from software application programs and converts the document to a fax card format that uses a 196 dot/in. printer driver. The product supports nine Group III fax file formats and sells for $349.

Inset Systems
71 Commerce Drive
Brookfield, Conn. 06804
203-775-5866

Hewlett-Packard Co. has introduced a language processor that is said to allow the HP Vectra, IBM Personal Computer, AT, and other MS-DOS PCs to function like HP 9000 Series 300 workstations.

Called BLP-II, the processor reportedly offers graphics performance up to 3.7 times faster than the original BLP-I as well as faster boot operation. The processor is said to feature bidirectional communication between HP Basic, running in the background mode, and DOS applications and data files on internal hard disks.

The price is $2,295, and an upgrade kit is available at an introductory price of $395, if ordered before the end of 1989.

HP
19319 Pruneridge Ave.
Cupertino, Calif. 95014

Cerritos Computer Services, Inc. has upgraded its software utility that allows pen plotter materials to be printed on dot matrix and laser printers.

CGplot reportedly converts Hewlett-Packard Co.'s graphics language instructions into a format that can be printed on many dot matrix and laser printers. It is said to include a presentation-quality font in addition to the standard pen plotter font. Delivered with a graphics data spooler, CGplot requires 256K bytes of memory and MS-DOS 3.0 or higher.

The price is listed as $395.

Cerritos Computer Services
Suite 1
4320 Atlantic Ave.
Long Beach, Calif. 90807
213-595-8607

Macintosh products

Toshiba America Information Systems, Inc. has announced Mackit 140, a high-capacity disk-drive subsystem for the Apple Computer, Inc. Macintosh. A 140M-byte hard disk drive with an installation kit for plug-and-play compatibility, the drive is said to provide a 23-msec average access time, 10M bit/sec. data-transfer rate and menu-driven software with utilities to install, interleave, format, partition and verify the hard disk.

Available now, the subsystem sells for $1,695.

Toshiba
9740 Irvine Blvd.
Irvine, Calif. 92718
800-456-3475

Xerox Imaging Systems has announced a text-scanning software package that is said to bring intelligent character recognition to Apple Computer, Inc. Macintosh-compatible optical scanners.

Released under the Datacopy brand name, the Accutext software reportedly features extremely accurate scanning by using intelligent character recognition techniques and an accelerator card. It requires 4M bytes of system memory, can interpret text styles that range from 6 to 24 points and supports various scanning systems, the vendor said.

The package sells for $995.

Xerox Imaging Systems
1215 Terra Bella Ave.
Mountain View, Calif. 94043
415-965-7900

Development tools

Caseworks, Inc. has announced a software development tool that is said to reduce the learning curve required for programming under OS/2 Presentation Manager.

Called Case:PM, the program automatically generates the Presentation Manager portion of any application, the company said. In addition, Case:PM includes a front-end prototyper facility that can be used to describe the Presentation Manager interface portions of the application.

Case:PM is priced at $795 for a limited time.

Caseworks
Suite 130
1 Dunwoody Park
Atlanta, Ga. 30338
404-399-6236

Poqet Computer Corp. has announced Entryway, an object-oriented application development product for the IBM Personal System/2 and personal computer environment. It is reportedly designed to enable users to build stand-alone and coordinated business applications through a procedure resembling writing a memo or letter. According to the company, features include a script language, debugging and test facilities, a hypertext facility, forms generation and compatibility with IBM's Common User Access development standard.

The price is $795, with a run-time package available for $250.

Poqet Computer
Delta Logic Division
Suite B
550 Hartnell
Monterey, Calif. 93940
408-373-8688

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DATA STREAM

Walter Ulrich

Next step, standards

First of two parts

Starting from a small base in 1976, inter-enterprise communications have grown steadily. Today, some six million people use electronic mail, and thousands of companies are either using or experimenting with electronic data interchange (EDI). Electronic access to commercial databases is a $3 billion business, and videotex services such as IBM's Prodigy are just now extending electronic communications to more small businesses and consumers.

The success of inter-enterprise communications has given rise to new concerns. Minor inconveniences that are barely nuisances when volumes are small become intolerable when volumes are large. People and companies are now extending the reach of their communications to places that would have been inconceivable 10 years ago. Users are becoming more sophisticated and more demanding.

My clients are telling me that three issues are critical to them if inter-enterprise communications is to flourish: in-

Continued on page 49

Netware, OS/2 gap bridged

BY CHARLES VON SIMSON
CW STAFF

Racal-Interlan finally crossed the finish line in the race to span the chasm between IBM and Microsoft Corp.'s OS/2 LAN Manager and Novell, Inc.'s Netware network operating systems. The Racal-Milgo, Inc. subsidiary recently announced the availability of a software bridge that transparently connects the two environments, offering users an immediate solution and beating Novell to market by at least several months.

LMN Server will allow Netware users full access to files on LAN Manager servers as if they were resident under Netware. Users with workstations running under LAN Manager will initially be able to copy only Netware files.

The product will allow users running both OS/2 and Netware to hedge their bets between the two systems until long-term technology directions become more clear. "It will be a horse race between Novell and the OS/2-based systems," said Jim Fennessey, director of information systems and services at Johns Hopkins University's School of Public Health, a beta-test site of LMN Server. "Novell's OS/2 support may be there in six to eight months, but until then I have to get people moving toward OS/2 as smoothly as possible without disrupting Netware systems."

LMN Server will contain two software modules. The first will include Netware's Internetwork Packet Exchange protocols, which are used to format data for transmission.

The second module is a translator that converts the Netware core protocol packets into LAN Manager and OS/2 formats. The two systems in combination will allow Netware DOS users to access LAN Manager files without learning OS/2 commands.

Racal-Interlan originally announced the product more than a year ago, creating anticipation and ultimately frustration — on the part of end users eager for a solution to the operating system gulf that had opened between Novell and 3Com Corp. 3Com's 3+Open operating system is based on LAN Manager.

Novell last month announced it would span the gap by supporting the Named Pipes programming interface, but the product, Netware OS/2 Requester, will not ship until the first quarter of 1990.

Tariffs designed to let users 'taste-test' ISDN

BY ELLIS BOOKER
CW STAFF

"Try it, you'll like it" is a marketing tactic with a long and successful history. Now, regional holding companies hope that corporate customers will try and stay with Integrated Services Digital Network (ISDN).

Southwestern Bell Telephone Co. is among those that want to drum up prospective customers with its tariff, which would allow users to try as many as 32 ISDN lines for up to one year.

Southwestern Bell's two starter packages for ISDN, filed with the Texas Public Utility Commission earlier this month, reflect welcome movement on the ISDN tariff front. Users have long complained that they cannot judge the usefulness of the technology until local carriers nail down pricing details.

While virtually all the Bell operating companies have rolled out trials of one kind or another — and a number have real ISDN subscribers on customer-specific contracts — only one company, Illinois Bell, has had an ISDN tariff on the books. Illinois Bell, an Ameritech company, filed its tariff for a usage-sensitive ISDN service last year. In fact, Illinois Bell is in the process of wrapping up what it calls the nation's largest ISDN project, a 10,000-ISDN-line installation for AT&T Bell Laboratories in Naperville, Ill.

Meanwhile, Pacific Telesis Group has filed with California regulators and hopes to have Pacific Bell's Centrex-based ISDN tariff ready by the end of the year. Nynex Corp. will probably submit its tariff in the fourth quarter of this year, a company spokesman said. US West hopes to deliver its tariff for small ISDN customers in early 1990.

But Bell South Corp.'s two operating companies, Southern Bell Telephone and Telegraph Co. and South Central Telephone Co., will reportedly not file tariffs until the end of next year. Similarly, Bell Atlantic Corp.'s tariffs are said to be a year away.

"The end of this year and all of next year will be the period of filing tariffs," said Steve Sazegari, a senior industry analyst at Dataquest, Inc.

Sazegari said that a pricing structure for ISDN seems to be emerging, judging from existing and planned tariffs. Those rates, he said, will be 1.2 to 1.3 times greater than conventional phone line charges.

However, Sazegari went on to observe that "the contract-by-contract rate is much lower, about 1.1," which suggests that telephone companies will try their utmost to protect existing ISDN customers from price hikes once the tariffs come through. "The companies might grandfather the rates, so any existing contract will continue until the contract is up . . . and by that time the [telephone company] could have filed to reduce the

Continued on page 51

Inside

- Novell polishes SNA gateways. Page 48.
- AT&T spiffs up TCP/IP support. Page 49.
- Loose ends tied on international network. Page 51.

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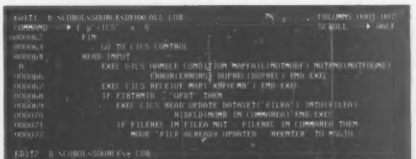

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A joint agreement with **Teleport Communications-New York** is providing **Comdisco Disaster Recovery Services** with 45M bit/sec. circuits to support ongoing backup of critical data and software for Comdisco's New York-area customers. **Prudential Bache Securities, Inc.** will be the first customer of the new high-speed DS3 service, which includes both fiber-optic connections and a microwave link between Comdisco's Business Recovery Center in Carlstadt, N.J., and the World Trade Center in Manhattan.

Polytechnic University announced that it plans to launch an executive master's degree program in management of technology next January. The program will include a traditional core but will focus on the role of technology in the enterprise. Classes will meet every other week on Fridays and Saturdays for two academic years at Polytechnic's Westchester Graduate Center in Hawthorne, N.Y.

Rational Systems recently signed an agreement to provide the **TOPS Division of Sun Microsystems, Inc.** with its DOS/16M technology, which will be used to enable TOPS DOS software to operate in the extended memory of most DOS computers. This will allow TOPS products to share memory with larger personal computer applications, a greater number of applications or terminate-and-stay-resident programs. TOPS will also be able to take advantage of the greater memory-addressing capabilities available with Intel Corp. 80286- or 386-based PCs.

Aries-MPSG has announced a service that gives pricing and availability within a certain region for fractional T1 services offered by **AT&T**. The Rockville, Md., consulting firm will offer the same service for fractional T1 offerings recently announced by MCI Communications Corp. and U.S. Sprint Communications Co. as they become available, Aries said.

Use of the **Kermit** multivendor file-transfer protocol has spread from the U.S. to Western Europe, Japan, and now to even the Soviet Union and other Eastern Bloc countries, according to the de facto standard's developer, Columbia University.

Novell boosts SNA gateway product line

BY CHARLES VON SIMSON
CW STAFF

Looking to strengthen its offering in a crowded, competitive market segment, Novell, Inc. recently announced Version 1.1 of its Systems Network Architecture (SNA) gateway product line. The enhancement includes upgrades to its IBM 3270 workstation and local-area network gateway products.

Netware 3270 enhancements include a 30% reduction in required workstation resources as well as support for multiple screen sizes.

Upgrades to LAN gateway products include some improvement in performance, enhanced network monitoring capabilities and a new synchronous adapter board that provides remote Synchronous Data Link Control connectivity over the V.35 protocol, a feature that was absent from Version 1.0.

Gerry Machi, director of marketing for Novell's communications products division, called the announcement a reinforcement of the commitment that the company has made to the SNA gateway market.

Analysts unconvinced

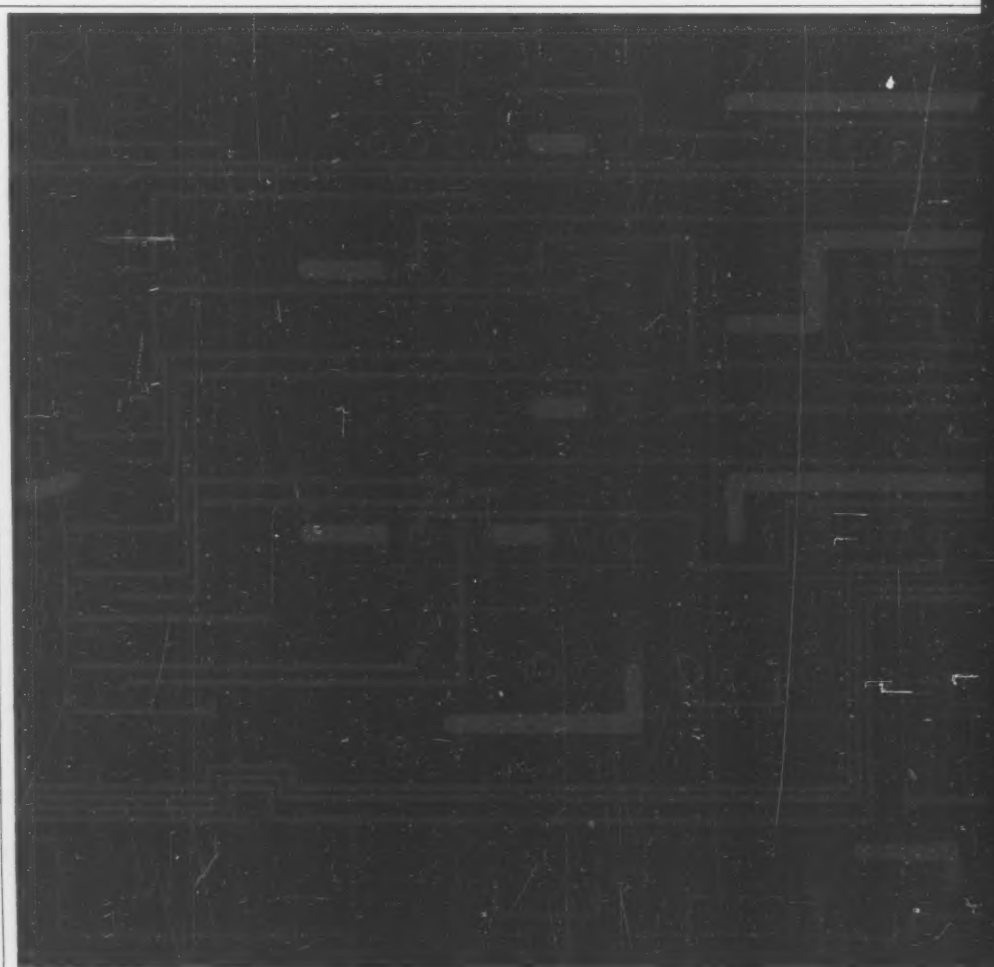
Analysts wondered out loud, however, how effectively Novell could compete with products from Digital Equipment Corp. and IBM in the enterprise connectivity environment.

"Novell has put too much emphasis on SNA connectivity," said Brad Baldwin, networking analyst for Dataquest, Inc., a San Jose, Calif., market research firm. "It is a niche market with a lot of competitors."

Baldwin continued that Novell may find it difficult to position its products against DEC's Decnet-to-SNA offerings and IBM's Token-Ring products.

In another recent announcement, Novell said it will raise prices along much of its Netware product line. Prices will increase by $300 on SFT, Advanced and ELS Level II products.

Analysts attributed the increase to similar hikes by competitor 3Com Corp. in June and Novell's desire to spur sales of products already in the distribution channel in the wake of disappointing third quarter results.



Created by Dayner/Hall, Inc., Winter Park, Florida

Ulrich

CONTINUED FROM PAGE 47

terconnection, directories and security. This two-part column will discuss each of these issues in turn.

Interconnection is needed between different messaging services and products. This would allow people in different companies to exchange messages without worrying about which type of system they use.

Buyers want to compare prices in different electronic catalogs without disconnecting from one system and logging onto another. Customers want to check product availability and order status without concern for which vendor is the middleman. Interconnection is key to establishing reach and enlarging critical mass for electronic messaging systems.

Good progress was made between 1984, when the X.400 standard was approved, and 1988. EDI vendors recognized the need for and implemented ways to exchange EDI transactions. Electronic mail service companies developed gateways to their customers' in-house computer systems. Common user interfaces were developed so that database users could access many databases using a single command set. Service vendors extended their reach overseas wherever European communications authorities had compatible systems. Still, many service vendors were not interconnected.

The year 1989 has been a banner one for interconnection. User groups such as the Aerospace Industry Association have become better organized and demanded interconnection. Vendors responded and have demonstrated real interconnection. Now, vendors are working together to resolve the remaining details. While the immediate resolution will be imperfect, interconnection will likely be accomplished this year.

Electronic messaging directories will play an increasingly important role as interconnection becomes widespread and practical. They should be as easy to use and as vendor-independent as today's telephone directories.

However, there are some difficult issues to resolve first. Communications users want to protect their internal mailing lists but also want to make their people available for valid business reasons. Junk faxes may have a chilling effect on those who decide how open or how restrictive their company's electronic directory will be. Users' desires for ease of use and tight security are contradictory.

Vendors face the same dilemma. They want the widest possible access to other vendors' directories, but they also want to protect their own customer lists. My sense is that vendors are more progressive in 1989 and are willing to be more open to generate more traffic. The details of directories are being worked out. However, resolution is not expected for two years, and complete implementation may be five years away. Fortunately, interim steps may be adequate.

The source of most intercompany telephone numbers is a business card, anyway. More people are putting electronic addresses and fax numbers on their business cards. Once people begin to add electronic addresses to their Rolodexes, they will be able to reach their colleagues. Furthermore, computers enable addresses to be stored electronically and recalled using nicknames or key words.

Ulrich is client services director for the information and telecommunications systems consulting section at Arthur D. Little, Inc., in Cambridge, Mass.

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AT&T sticks by TCP/IP support

BY ELISABETH HORWITT
CW STAFF

MORRISTOWN, N.J. — Taking the position that users are still not ready to trade in their Transmission Control Protocol/Internet Protocol (TCP/IP) networks in favor of the "true" Open Systems Interconnect (OSI) standard, AT&T recently enhanced its support of TCP/IP with two debuts. It also announced support of Sun Microsystems, Inc.'s Network File System protocol for the Unix-based AT&T 6386 Workgroup System and 3B2.

"A lot of people are perfectly happy with TCP/IP and the services it offers, viewing it as a stepping stone to OSI," said AT&T product manager Richard Kappel.

In the TCP/IP area, AT&T announced the following products for immediate availability:

- TCP/IP Unix System Interface, which is said to provide communications based on the de facto standard for users of AT&T's Unix-based 6386 Workgroup Systems. The product is priced at $1,495.
- TCP/IP WIN/3B Release 3.0.1 software that is said to provide TCP/IP networking for AT&T 3B2 minicomputers. It is based on the University of California at Berkeley Unix 4.3, with support for Unix 3.2 security features. The product costs $4,995.

Although AT&T previously offered TCP/IP support for its systems, the announcements are part of the vendor's strategy to "expand our support across our processor platform, keeping our evolution in sync with where Berkeley is going, because [Berkeley Unix] is the focal point for setting TCP/IP standards," Kappel said. The new releases improve performance over past products, he added.

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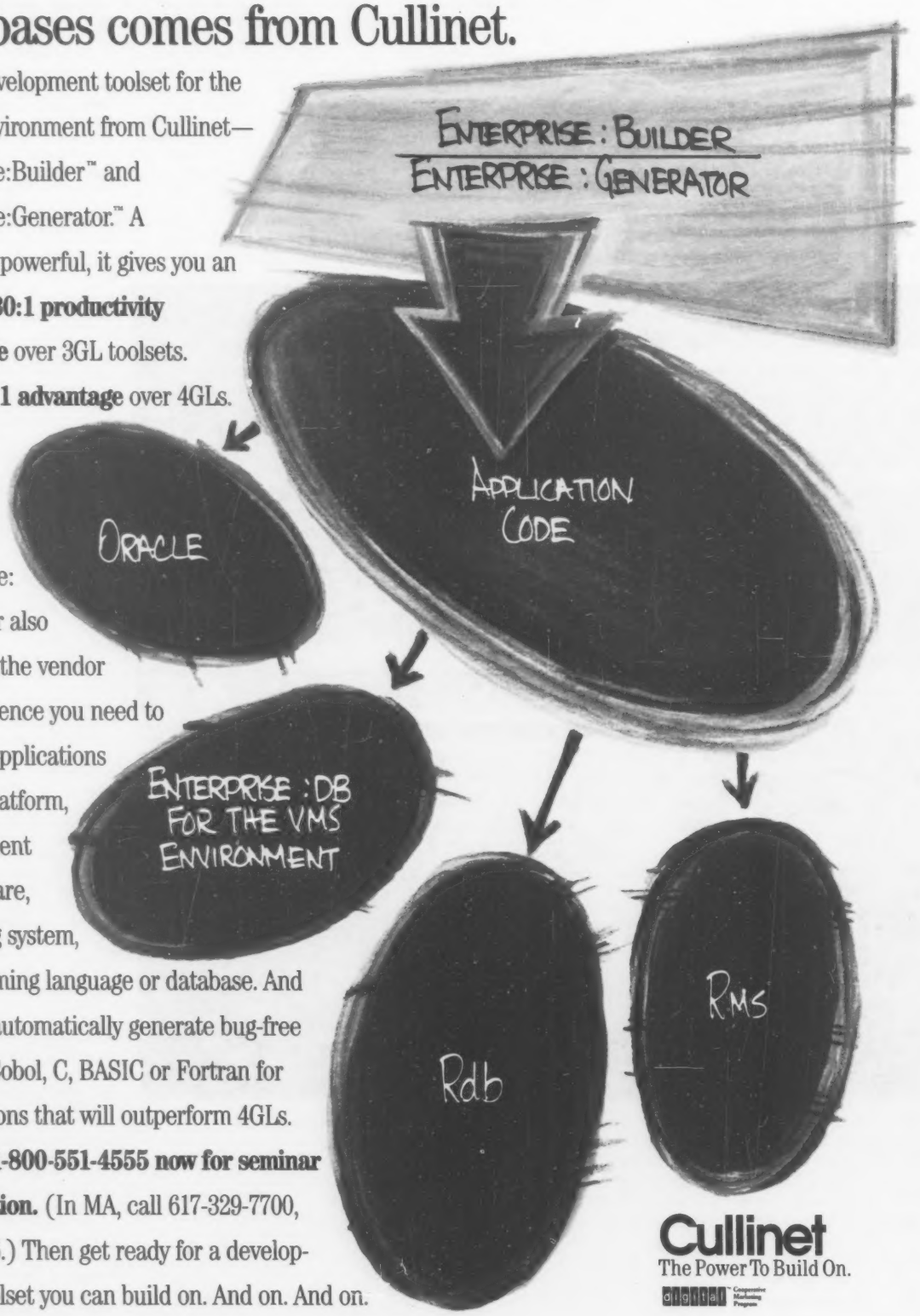

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Global nets: Seeds sprout

Study finds intercontinental need exceeds original design

ANALYSIS

BY ELLIS BOOKER
CW STAFF

BOSTON — Once established, global high-performance private networks tend to expand quickly, often growing much faster than expected and demanding ever more sophisticated network management tools, according to a recent survey by The Yankee Group.

Traffic on these international private networks outpaced design expectations "by very wide margins," the study found. Despite the best efforts of the network designers, new applications — notably electronic mail, facsimile and telex — rapidly filled their networks, the respondents said. In one case, the monthly rate of growth was greater than what had been planned for the entire first year.

Interestingly, far from being unhappy with the unanticipated traffic, a number of users interviewed by The Yankee Group suggested that the greater-than-expected use of the network was beneficial — politically speaking — because it helped justify to top management the wisdom of deploying the network in the first place.

Prior to putting their integrated networks in place, most of the users in the study, which involved 14 unnamed Fortune 500 and a few Fortune 10 companies, had used dial-up modem networks with a top speed of 9.6K bit/sec. After the conversion, the networks sped up to 56K or 64K bit/sec.

Need for control

The survey found that the leading problem cited by all the users involved an increasing need for flexibility and connectivity — in essence, control — of the network. Control of costs and control of coordination or management were the next items of concern. Specifically, users said they wanted better statistics, reporting and integration of the vendor's network management package with other systems.

But users virtually discounted many other issues, such as availability and reliability of network resources and data security, The Yankee Group found.

"Vendors have done such a good job structuring their global networking products that most of the issues we expected users to raise never materialized," said Jack Freeman, senior analyst at The Yankee Group.

The Yankee Group study focused on networks implemented by eight network vendors, including AT&T, GE Information Services and McDonnell Douglas Corp. subsidiary Tymnet, Inc. Excluded from the survey were homegrown global networks built by users themselves, as well as those established by computer companies and systems integrators.

Although the Yankee Group survey did not identify its respondents, the experiences of these users jibe with that of Mattel Toys, Inc., which recently concluded major work on a global 17-node voice, data and telex network.

Like the users in The Yankee Group's survey, Jeff Harris, director of information technologies at the Hawthorne, Calif.-based toy maker, said traffic on the network quickly grew beyond expectations. "It is not necessarily a failure in the [design] as much as it is additional work that may not be part of the original plan," Harris said.

He noted that once users are connected, they quickly find additional applications for the network such as sending a report via fax or E-mail instead of through conventional mail.

Mattel's multicountry network, the major portion of which was installed in 12 months, uses 56K bit/sec. satellite circuits for domestic U.S. traffic as well as for connections to Europe and the Far East.

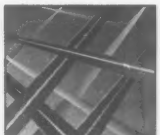
"It's like putting a telephone on somebody's desk," Harris explained, referring to the seemingly endless need for new services and additional bandwidth. "Once they see it, the demand continues to increase." Harris said that users have already begun requesting increased bandwidth on some parts of Mattel's as-yet-unfinished global network.

U.S. research linked overseas

BY JAMES DALY
CW STAFF

The age of *glasnost* reached the supercomputing world recently when the West German branch of an international network opened for business, tying together some of the few remaining loose ends on a network that now connects seven U.S. supercomputer sites with similar facilities in Europe and Japan.

The Energy Sciences Network (ESnet) links a series of smaller networks and allows the exchange of electronic mail and sharing of scientific data, possibly even with researchers in the Soviet Union, said Robert Borchers, associate director for computation at the University of California Lawrence Livermore National Laboratory in Livermore, Calif. The network is also part of an interlocking group of high-speed backbones that link research groups and supercomputing centers throughout the world, such as the National Science Foundation's NSFnet [CW, Aug. 14].



At Borchers' site, for instance, ESnet taps into a bevy of Cray Research, Inc. machines servicing the Magnetic Fusion Energy Network and the High Energy Physics Network. Those facilities are connected to four major remote sites via satellite, and the remote sites in turn serve as hubs for a web of land lines that interconnect 4,000 researchers at more than 140 colleges, universities, industrial sites and national research facilities.

ESnet is also linked to the Japanese Institute of Plasma Physics at Nagoya University as well as the European Center for Nuclear Research near Geneva, Switzerland, and the Max Planck Institute in Garching, West Germany, via a 64K bit/sec. satellite connection.

ESnet is in turn connected to a number of other high-speed informational networks, including NSFnet and Internet. "This whole connection game has gotten pretty wild," Borchers said. "It seems that anyone who has TCP/IP these days is connected to one another."

Although Borchers said expansion plans for the network include tapping into the Soviet Union, there have been some security problems. "We're facing a bit of a dicey problem because current regulations restrict the Soviet Union's access to our high-speed computers," he said.

A Band-Aid approach has been worked out, he said, in which several dozen Soviet researchers work at a number of Swiss sites that have access to ESnet. The Swiss scientists will then run mathematical problems handed to them by the Soviets, thus circumventing a U.S. State Department regulation that forbids Soviet Bloc citizens from having direct access to U.S. supercomputers and supercomputer facilities.

By the end of the year, Borchers said, ESnet personnel hope to have all the systems connected via a T1 backbone with a transfer rate of 1.5M bit/sec.

ESnet staff are also talking with a number of federal research agencies about a project to provide multiple T1 circuits and an entire T3 circuit for use by participating agencies.

ISDN

CONTINUED FROM PAGE 47

tariffed rate."

Southwestern Bell's so-called ISDN Starter Packages will come in two flavors: Starter Package 1, with two B channels carrying circuit-switched voice or data, and one D channel, which also can be used for packet-switched customer data; and Starter Package 2, which would add the additional capability of packet-switched customer data on the two B channels. Both packages will be sold in increments of eight Basic Rate Interfaces (BRI).

ISDN permits multiple simultaneous voice and data connections over a single twisted-pair phone line. A BRI is composed of two 64K bit/sec. B channels for voice or data and one 16K bit/sec. D channel that carries packetized signaling data but can also be used for delivering low-speed customer data.

None of the regional companies has issued a tariff for ISDN Primary Rate service.

Southwestern Bell said it could begin its starter packages, provided they are approved by the Texas commission, by mid-September.

The starter package services will be available to customers served by the nine ISDN-equipped digital central offices in Dallas, Houston and San Antonio. Currently, Southwestern Bell has contracts with nine customers to provide ISDN to more than 17,000 lines.

Starter Package 1 users will pay $21.50 per month for each BRI, in addition to a $25 flat-rate business-line access charge and a $5 subscriber-line charge; Starter Package 2 users will pay $99 per month for each BRI, plus a $5.40 per month common-line charge.

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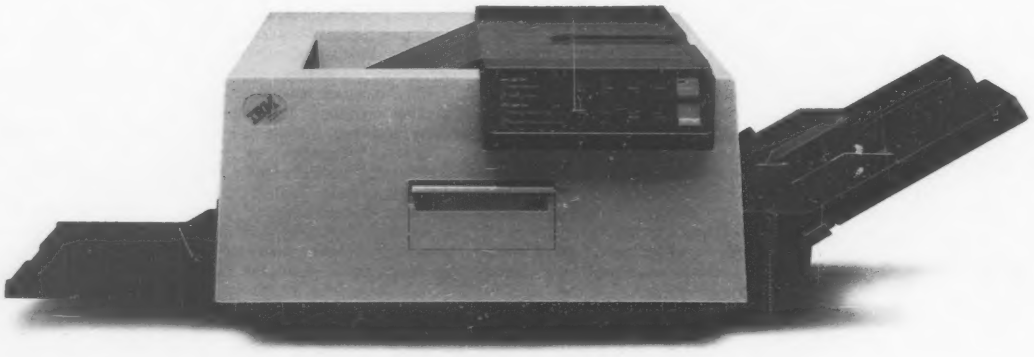

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Penril Datacomm has announced an X.25 option for the company's recently announced VCX-100 statistical multiplexer.

The device is available in both eight- and 16-port configurations and can also be used as a small data private branch exchange or a wide-area network extremity, the vendor said. The X.25 packet assembler/disassembler option reportedly extends applications to a terminal concentrator connected to a packet network or a host concentrator connected to a packet network with local switching capability. The option costs $400.

Penril Datacomm
207 Perry Pkwy.
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301-921-8600

Multi-Tech Systems, Inc. has announced a 32-channel version of its Multimux line of statistical multiplexer products.

The Multimux 32 reportedly features dual composite links with internal modems with speeds up to 14.4 bit/sec., external modem options and dynamic load balancing. The unit offers data rates per channel up to 9.6K bit/sec. to provide a maximum aggregate channel input of 3.07M bit/sec. for the 32-channel configuration, the vendor said. Prices range from $3,495 to $10,295, depending on the number of channels.

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Mounds View, Minn. 55112
800-328-9717

Advanced Computer Communications has announced X.25 and High-Level Data Link Control (HDLC) communications front-end processors for use with Digital Equipment Corp. VAXBI bus computer systems.

The ACP 7000 communication processors reportedly support X.25 and HDLC at line speeds up to T1 and extended frame and packet sequencing for satellite links. According to the vendor, the processors also support HDLC framing-only mode for use in custom configurations that do not require the entire HDLC protocol suite.

Both the ACP 7100 (HDLC version) and ACP 7250 (X.25 version) models are listed at $9,500.

Advanced Computer Communications
720 Santa Barbara St.
Santa Barbara, Calif. 93101
805-963-9431

Diagnostic equipment

Casat Technology, Inc. has announced a remote diagnostic port monitor for Ethernet networks.

Called the ERT-4308 Remote Diagnostic Monitor, the unit can reportedly be placed anywhere between a network DTE port and transceiver to provide visual indication of data transmission and reception, the presence of collision signals and the presence of transceiver power. Requiring no external power, the monitor is said to attach to a 15-pin cable connector with slide latches and measures 3/5 by 1¾ by 2½ in.

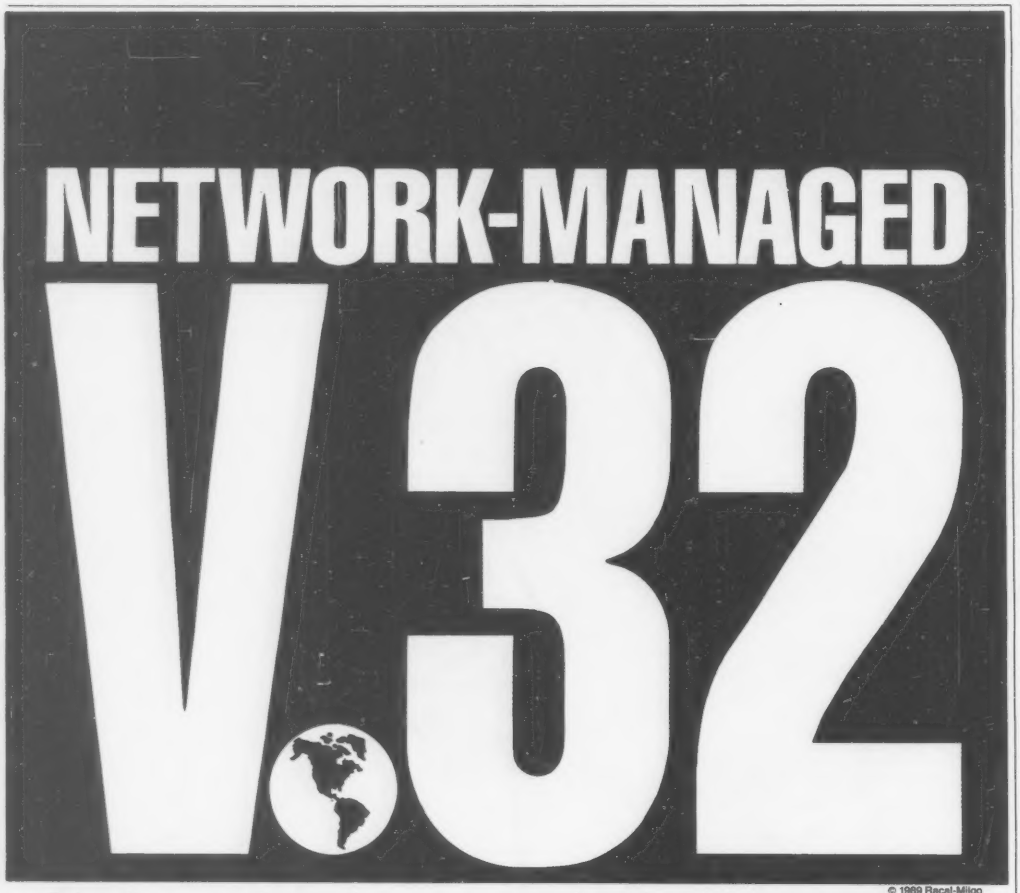
The retail price is $95.

Casat Technology
10 Northern Blvd.
Amherst, N.H. 03031
603-880-1833

LP Com, a subsidiary of Tektronix, Inc., has introduced a recording option that reportedly boosts the performance of the company's protocol analyzers from 64K bit/sec. to 256K bit/sec. for full-duplex operations.

According to Tektronix, the option consists of software and a special protocol analyzer board for the company's TC 2000 and TC 1000 test and analysis products. Said to provide a trigger function that prevents blind recording, the option sells for $1,200.

Tektronix
LP Com Subsidiary
205 Ravendale Drive
Mountain View, Calif. 94043
415-967-5400



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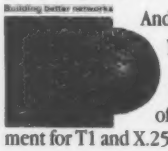

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Frank Pahlke has been named director of computer services at **PCS, Inc.**, a Scottsdale, Ariz.-based manager of prescription drug benefit plans for insurance providers.

Pahlke returned to PCS after working in information systems for the city of Phoenix, where he moved from MIS division administrator to MIS deputy director in charge of the city data center. He was senior manager of PCS' systems software support in 1987.

Prior to that, Pahlke held IS management jobs in Arizona with Baptist Hospitals and Health Systems and Applied Information Development and in Michigan with Baker Perkins, Inc., Clark Equipment Co. and James Heddons & Sons. Pahlke is a part-time instructor in the Maricopa Community College District.

.....

Ira J. Newman has joined **Western Telematic, Inc.** in Irvine, Calif., as director of MIS, reporting to President David L. Morrison. Western Telematic is a data communications equipment manufacturer.

Newman has worked for nine years in IS management at National Emblem in Carson, Calif., most recently as director of administration. He was previously a software specialist at MAI Basic Four, Inc. in Tustin, Calif. Newman holds a bachelor's degree from Fairfield University and an MBA from California State University, Long Beach.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

A sentimental journey to success

American Greetings sends the right message with EDI, computer graphics

BY GLENN RIFKIN
CW STAFF

When Jacob Sapirstein began selling inexpensive postcards from a horse-drawn wagon on the streets of Cleveland in 1906, he couldn't have dreamed that his budding business would become a $1.3 billion greeting-card giant.

Sapirstein's enterprise, now known as American Greetings Corp., is second only to Hallmark Cards, Inc. in the $4.3 billion greeting-card and sentiment industry. Although Christmas cards, Ziggy, Care Bears and sappy verse hardly conjure images of technology, American Greetings is embracing information systems with the realization that IS is crucial to survival.

After decades of growing profitability, American Greetings last year saw earnings fall from $63 million in fiscal 1987 to $33 million. Though net income recovered to $44 million in fiscal 1989, the Cleveland-based company is aware that nothing is invulnerable in this extremely competitive market.

"The competition has grown very stiff, the market is saturated, and margins are extra tight," says Dean Trilling, vice-president of information services. "But it's interesting to note that though profits are flat, top management still shows tremendous support for IS. No projects were stopped, and no budgets were cut. They tell us, 'We really do need these systems; get them done faster.' "

With imposing Hallmark lurking at one end of the market and hundreds of small, independent card makers at the other, American Greetings realizes it must improve its margins by providing better service to the distributors of its cards and other items.

JACK VAN ANTWERP

American Greetings' Trilling *likes top management's IS sentiments*

"In some businesses, IS can not only give a company an advantage but actually be used to put competitors at risk," Trilling says. "It's not like that here. Everyone in the industry is looking at the same tools, so it's more a matter of if you don't do technology right, you don't survive."

Trilling's IS group is working to provide a better profile of customers and their order needs for the company's sales and marketing forces. American Greetings is investing heavily in electronic data interchange (EDI) to forge stronger and more efficient rela-

Continued on page 59

Guide welcomes business partners

Conference will attempt to bring together IS, educators, other disciplines

BY JEAN S. BOZMAN
CW STAFF

Where once the information systems manager worked in isolation to meet an organization's information needs, today's IS department coordinates distributed computing throughout a corporation, linking desktops and remote servers nationwide and worldwide.

Recognizing that change, Guide International Corp. will open its next IBM users' conference to both IS managers and their business unit counterparts.

"We want our people to bring their business partner along," said Joe Correira, vice-president of conferences for Guide and an IS manager at The Travelers Corp. in Hartford, Conn. "As we go further into the information age, we're seeing that senior IS people aren't necessarily as concerned with the bits and bytes as they are with managing issues."

The five-day conference, entitled "Information Systems Perspectives: Affecting the Global Market," will be held in San Francisco Oct. 1-5. This special edition of Guide will retain the format of speakers, discussions and informal meetings among peers. "We're trying to put together the IS people with educators and practitioners of other disciplines," Correira said.

The featured speaker is Terry Lautenbach, general manager of IBM United States. Other speakers will explore subject areas well outside the traditional issues surrounding IBM mainframe shops. Among them will be John Naisbitt, author of *Megatrends*; MIT economist Lester Thurow; and Jeane J. Kirkpatrick, former U.S. Ambassador to the United Nations.

The global economy was chosen as the theme because IS departments are facing the task of building global networks for multinational corporations.

Another global issue involves where to place foreign plants to take advantage of lower overseas labor costs. "It's cheaper to make parts in Taiwan than it is here, based on the cost of labor," Correira said. "The question is, what would change in that equation if you could really automate with information systems? Then, you could get the same job done here; you could do the job better through automation."

Computerworld

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The newspaper for information systems management

TAKING CHARGE

John M. Thompson

Time to shake the tree

Sometime back in the 1960s, we stopped learning how to improve our business practices. Automation came along and froze us into the way we did things at that point. In successive waves of faster, smaller, decentralized, on-line technological innovations, we have reautomated with layers of complexity, interconnectivity and dependency. The result is an information systems infrastructure that is almost unmanageable.

In 1963, I was an order-entry clerk for a chemical company in New York. I "processed" orders and I "expedited" documents. There wasn't a computer in sight.

I was moving fibers out of South American plants. Neil, at the next desk, was shipping plastics out of Texas. We both learned our jobs from Walter, who had been there for 36 years, wore a hat, drank martinis at lunch and smoked like a chimney. When Neil and I found a smarter way to "process" or "expedite," we changed the system. We constantly reorganized our tub files to make life easier. I was encouraged.

By the time I moved on, the process was quite efficient. Then my contribution to order processing was immortalized — shortly after I left, they automated it, freezing in place the process that I had passed on to my successor.

In the mid-1970s, that first system was replaced with an on-line version; the tub file was reautomated to a desktop terminal. The company merged with another and wanted to have common systems for order processing, but my old New York unit insisted that their needs (my ways of moving the paper around) were different from the others' and that only customized solutions would satisfy the business need.

In the 1980s, PCs crept in and my successors' successors were allowed — for the first time in about 20 years — to be creative. They wrote little batching programs to follow the status of orders through the cumbersome, automated system. However, as in Budapest in 1956, this freedom was not allowed to flourish for long. The IS people — who saw their responsibility as creating a uniform, integrated, enterprisewide common database — sent the tanks in and froze the process once more, all in the name of serving the user.

This well-meaning, misguided pursuit of short-term cost reduction through automation has hampered organizational learning by prohibiting the redesign of business processes. Further, the unmanageable layers of complexity resulting from successive generations of mindless reautomation leaves an information-intensive business in very real jeopardy.

Getting out of jeopardy is a matter of survival for many. Organizations that will be around in 10 years are redesigning for simplicity. They are taking a giant step back to the time when order-entry clerks — and everyone else — were encouraged to improve the system, to the time when workers were encouraged to think.

Japanese manufacturers make the doers the designers, and the process is subject to continuous improvement. Americans have such faith in technology that we seek the all-seeing, all-dancing comprehensive solution — the B1 bomber approach.

As a result, for 20 years we have ended up with systems that are over-specialized, over-designed, over budget and overdue. Europeans who are challenged by the post-1992 internal market are being forced to reexamine and redesign their multinational operations for a transnational Europe.

It would be too bad if the wonderful inventions in information technology turned out to be handcuffs. It would be sad if this great enabler of change turned out to be the great disabler. And it would be inexcusable if, in the battle for short-term return on investment, automation ended up killing off organizational learning.

If we hadn't invented computers, we could never have allowed our organizations to become so complex. Let's redesign for simplicity.

Thompson is vice-chairman of Index Group, a Cambridge, Mass.-based management consulting firm.

Service conference seeks talks

The Hi-Tech Service & Maintenance Exposition and Conference, slated for Oct. 31 to Nov. 2 in Chicago, is seeking speakers to address all aspects of computer maintenance and repair.

Among the topics suggested for discussion include strategic management of service businesses; use of high-technology service as a strategic differentiator; parts control and distribution; third-party maintenance services; reliability and maintainability analysis; and the use of artificial intelligence in maintenance.

A discussion on marketing and pricing of high-technology service and support was also suggested.

Authors interested in speaking at the conference should send an abstract of their proposed paper to Technical Conference Chairman Donald Blumberg, D.F. Blumberg & Associates, Suite 200, 1260 Virginia Drive, Fort Washington, Pa. 19034.

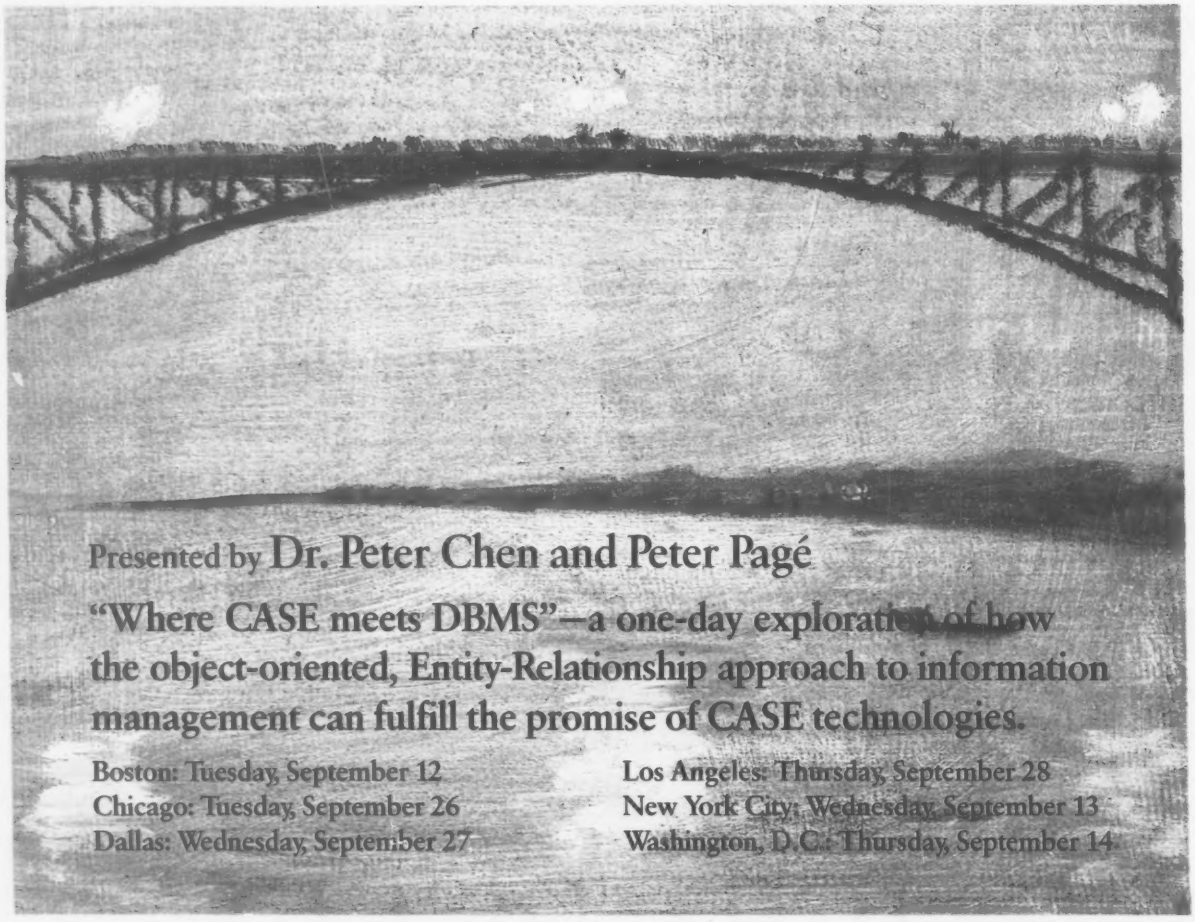
THEIR "RULES."

```
/* MSG IKJ574I / * Reduce broadcast dataset full messages * /
                 / * to 1 every 5 minutes * /
/ * INIT SECTION * /
prevtime = TIME(m) - 5
/ * PROC SECTION * /
IF (TIME(M) - prevtime > 5) | (TIME(M) - prevtime < 0) THEN DO
        prevtime = TIME(M)
        msg. user = 'DISPLAY'    / * Done for another Rule * /
        RETURN DISPLAY
END
/ * Here when an IKJ574I displayed in the last 5 minutes * /
msg. user =
RETURN SUPPRESS
```

OUR RULES.

```
MSGID(IKJ574I), SUPRESS
MSGID(IKJ574I), EVERY (5 MINUTES), DISPLAY
```

Come see "Where CASE meets DBMS"



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Professor Peter Chen—the "father" of the Entity-Relationship approach... author of the landmark "Entity-Relationship Model: Toward a Unified View of Data" while at M.I.T...now, Foster Distinguished Chair at Louisiana State University.

Peter Pagé—Executive Vice President of Software AG, the first major systems software company to develop extended data base technology based on the Entity-Relationship model.

Together, Prof. Chen and Mr. Pagé will present "Where CASE meets DBMS," a one-day seminar which fully explores the ways in which these two major technologies merge to create truly strategic information management solutions.

Register now for the one-day seminar, "Where CASE meets DBMS" in the city nearest you. Call toll-free: 1-800-843-9534
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Greetings

FROM PAGE 55

tionships not only with customers but with suppliers as well.

American Greetings is unusual in that it distributes its cards mainly through supermarkets and mass merchandising outlets such as K-Mart. The company depends on its sales force to maintain displays at these retail outlets, so it is crucial that the salesmen have access to the latest information from American Greetings. Computerized reordering from customer sites is already in place for some American Greetings accounts, and the company is intent on spreading that capability around.

As supermarkets embrace the Uniform Communications System, a form of EDI, American Greetings must incorporate that technology into its IS operation as well, according to David Ledvina, vice-president of information processing.

American Greetings is currently developing order processing, order entry and inventory control systems, according to Dale Forman, who oversees the development of applications.

The system is being implemented over the next 1½ years. "We are working to improve turnaround and make it more consistent," Forman says. "We aren't getting complaints, but we'd rather be proactive than wait until something goes wrong."

Forman and Kenneth Penix, executive director of applications development, are also pushing improved forecasting applications as well as assisting end-user application development within American Greetings. Penix points out that American Greetings has long had time-sharing terminals around the company, so the more than 700 personal computers that have been installed did not meet much resistance.

But all the MIPS in the world will not sell greeting cards. Irving Stone, son of founder Sapirstein and chairman of American Greetings, believes that "art attracts, verse sells." So in the imprecise science of greeting cards, American Greetings' toughest task is to produce cards that buyers want.

To that end, American Greetings has made a strong commitment to state-of-the-art graphics systems for the creative department. "Everyone builds order processing, inventory control — the baseline support systems. I think the area with the greatest opportunity for the future is in graphics," Trilling says.

> "I DON'T WANT to totally distribute everything, but building an intergalactic headquarters is not the way to go, either."
>
> DEAN TRILLING
> AMERICAN GREETINGS

American Greetings' IS group numbers 300 and is centralized in the sprawling one-million-square-foot headquarters on the outskirts of Cleveland. Trilling is in the process of distributing some services out to remote sites but plans to keep the centralized approach. "I don't want to totally distribute everything, but building an intergalactic headquarters is not the way to go, either," he says.

The company has made substantial investments in personal computers, local-area networks and fiber optics to complement its IBM 3090 Model 200 environment.

Dave Wither, American Greetings' telecommunications manager, said his group has been implementing a backbone fiber-optic network for the past two years, as well as implementing Token-Ring LANs, including what Wither calls the largest Token-Ring implementation in northeastern Ohio. It is also in the process of hooking into a T1-based network. A giant satellite dish, which served the company's communications needs for 3½ years, is now for sale.

Trilling, who joined American Greetings in 1985 from Arthur Andersen & Co.'s consulting practice, was promoted to his current spot in the fall of 1988. He reports to the senior vice-president of operations. Although he is considered the company's chief information officer, Trilling does not sit on the strategic planning committee, which makes it clear to him that a barrier still remains between IS and American Greetings' top management.

"Part of my challenge is to make the CEO understand that IS should be part of that committee," he says. "To me, IS has not really arrived until I'm on that committee."

McCracken wins award

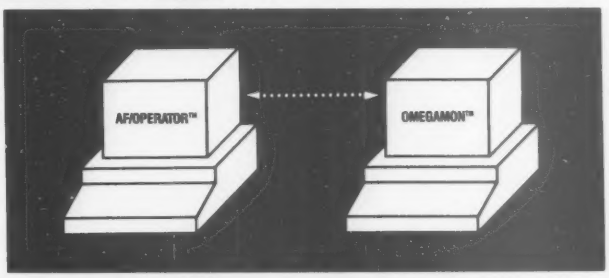
PALO ALTO, Calif. — Daniel D. McCracken, a computer science professor at City College of New York, has been named the recipient of the Computer Professionals for Social Responsibility (CPSR) 1989 Norbert Wiener Award for socially beneficial work in the computer profession.

McCracken founded and chaired Computer Professionals Against the ABM from 1969 to 1972. He has testified before Congress on the privacy implications of the National Crime Information Center and electronic funds transfer. McCracken has written or co-authored 25 computer science textbooks. He is a former president of the Association for Computing Machinery.

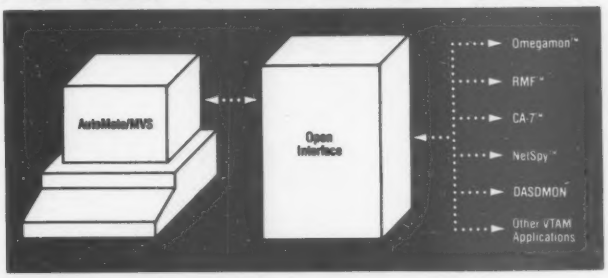
CPSR is a nonprofit organization of computer professionals seeking to raise awareness of technology issues in the public interest such as the reliability of software in the Strategic Defense Initiative, or "Star Wars," weapons program.

The award will be presented at CPSR's annual meeting in October.

THEIR INTERFACE.



OUR INTERFACE.



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* The Wall Street Journal (1987) — "Survey of the Information Processing Marketplace."
* The Adams Co. (1988) — "Information Systems Management Study."

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CALENDAR

"Distributed Systems: The Future of Computing" will be the theme of the 1989 Distributed Systems Conference, to be held in Santa Clara, Calif., Sept. 26-28.

The conference, sponsored by Dataquest, Inc., will cover topics such as changing information technology markets; networked architectures and applications; operating environments; the gap between vendors and users; distributed systems; the changing roles of personal computers, applications and interfaces; connecting the office; and X Window System displays.

For more information, contact the conference department of Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131-9980.

SEPT. 3-9

PCs vs. Workstations: The Battle for Second-Generation Computing. Santa Clara, Calif., Sept. 6 — Contact: Kathy Collins, International Data Corp., 5 Speen St., Framingham, Mass. 01701-9908.

Systems 3X Expo. New York, Sept. 6-7 — Contact: Systems 3X Expo, 27 Congress St., Salem, Mass. 01970.

Federal Microcomputer Conference and Exposition. Washington, D.C., Sept. 6-7 — Contact: Fed Micro '89, National Trade Productions, 313 S. Patrick St., Alexandria, Va. 22314.

International Enterprisewide Information Management Conference. St. Louis, Sept. 6-8 — Contact: Scott Schaefle, Center for the Study of Data Processing, Washington University, Campus Box 1131, One Brookings Drive, St. Louis, Mo. 63130-4899.

Conference & Exhibition for Worm/Erasable Optical Storage and Digital Document Image Automation. Arlington, Va., Sept. 6-8 — Contact: Meckler Conference Department, 11 Ferry Lane West, Westport, Conn. 06880.

Legal Issues in Information Technology: An Advanced Workshop. Washington, D.C., Sept. 6-8 — Contact: Vern Lautner, 135 W. 50th St., New York, N.Y. 10020.

Optical Information Systems Conference and Exhibition. Arlington, Va., Sept. 6-8 — Contact: Kim Grega, Meckler Conference Management, 11 Ferry Lane West, Westport, Conn. 06880.

Unix Computing Conference and Show. Anaheim, Calif., Sept. 6-8 — Contact: Expoconsul International, 3 Independence Way, Princeton, N.J. 08540.

Breakaway '89. Orlando, Fla., Sept. 6-9 — Contact: ABCD, the Microcomputer Industry Association, 1515 E. Woodfield Road, Schaumburg, Ill. 60173-5437.

Invitational Computer Conference on OEM Peripherals. Newton, Mass., Sept. 7 — Contact: Invitational Computer Conferences, 3151 Airway Ave., C-2, Costa Mesa, Calif. 92626.

Downsizing Corporate Systems: Coping with Decentralized Computing. Boston, Sept. 7-8 — Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

North American MAP/TOP Users Group Meeting. Toronto, Sept. 7-8 — Contact: Manufacturing Automation Protocol & Technical and Office Protocol Users Group, 2901 Hubbard, P.O. Box 1157, Ann Arbor, Mich. 48106.

Systems Application Architecture Seminar. Chicago, Sept. 7 — Contact: McCormack & Dodge, 1225 Worcester Road, Natick, Mass. 01760.

Telecommunications Technologies for the Nonengineering Professional. Cincinnati, Ohio, Sept. 7-8 — Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

New England Conference on Data Processing. Sturbridge, Mass., Sept. 8 — Contact: Data Processing Management Association, Boston Chapter, P.O. Box 1806, Boston, Mass. 02105.

Grafix '89. New York, Sept. 8-10 — Contact: Conference Management Corp., 200 Connecticut Ave., Norwalk, Conn. 06856-4990.

SEPT. 10-16

Information Industry Association Convention & Exhibition. New York, Sept. 10-13 — Contact: Information Industry Association, 555 New Jersey Ave., N.W., Suite 800, Washington, D.C. 20001.

International Technical Innovation and Entrepreneurship Symposium. Minneapolis, Sept. 10-13 — Brad Bertosch, Executive Director, The Wayne Brown Institute, 295 Chipeta Way, Salt Lake City, Utah 84108.

Technicom '89. Toronto, Canada, Sept. 10-13 — Contact: Ann Rockley, Technicom, c/o Apple Canada, 11 Allstate Pkwy., Suite 400, Markham, Ontario, Canada L3R 9T8.

Building an Effective Standards Program. Washington, D.C., Sept. 11-13 — Contact: Quality Assurance Institute, Suite 350, 7575 Dr. Phillips Blvd., Orlando, Fla. 32819.

Cadre User Conference. Dallas, Sept. 10-14 — Contact: Allen Hagger, Cadre Registrar, Computer Associates, Rte. 206 and Orchard Road, CN-5215, Princeton, N.J. 08543.

Data Center Automation Educational Symposium. Kansas City, Mo., Sept. 11-12 — Contact: The Association for Computer Operations Management, 742 E. Chapman Ave., Orange, Calif. 92666.

Computer Operations Management Educational Symposium. Kansas City, Mo., Sept. 11-12 — Contact: International Association for Computer Operations Management, 742 E. Chapman Ave., Orange, Calif. 92666-7966.

Disaster Recovery Planning. Atlanta, Sept. 11-12 — Contact: Vern Lautner, 135 W. 50th St., New York, N.Y. 10020.

International Disaster Recovery Symposium & Exhibition. Atlanta, Sept. 11-13 — Contact: Disaster Recovery Institute, c/o Disaster Recovery Journal, 2712 Meramar Drive, St. Louis, Mo. 63129.

National Industrial Transportation League's Data and Computer Systems Committee fall meeting. Hilton Head, S.C., Sept. 11-14 — Contact: NITL, 1090 Vermont Ave., N.W., Suite 410, Washington, D.C. 20005.

Networld '89. Dallas, Sept. 11-14 — Contact: Networld '89, Dallas, Texas, 385 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Computing in Civil Engineering. Atlanta, Sept. 11-13 — Contact: American Society of Civil Engineers, 345 E. 47th St., New York, N.Y. 10017-2398.

Comprehensive MVS/XA Performance Management Seminar. San Antonio, Texas, Sept. 11-15 — Contact: L&S Computer Technology, Inc., Mail Stop 120, P.O. Box 9802, Austin, Texas 78766.

Conference on Network Management. Phoenix, Sept. 11-15 — Contact: Dolores Sawtelle, Applied Computing Devices, Inc., Aleph Park, 100 N. Campus Drive, Terre Haute, Ind. 47802.

Interex 1989 Conference for Hewlett-Packard Computer Users. San Francisco, Sept. 11-15 — Contact: Interex, P.O. Box 3439, 680 Almanor Ave., Sunnyvale, Calif. 94088-3439.

ISDN Seminar. Tysons Corner, Va., Sept. 11-15 — Contact: Omnicom, 115 Park St. S.E., Vienna, Va., 22180.

Regional Disaster Recovery Planning Conference and Vendor Exhibit. Cherry Hill, N.J., Sept. 11-12 — Contact: Delaware Valley Disaster Recovery Information Exchange Group, P.O. Box 8511, Cherry Hill, N.J. 08002.

Telecommunications Management. Atlanta, Sept. 11-13 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521-2939.

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Vice President
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THE DEC MARKET

Can DEC find an opening on the desktop?

BY ALAN RADDING

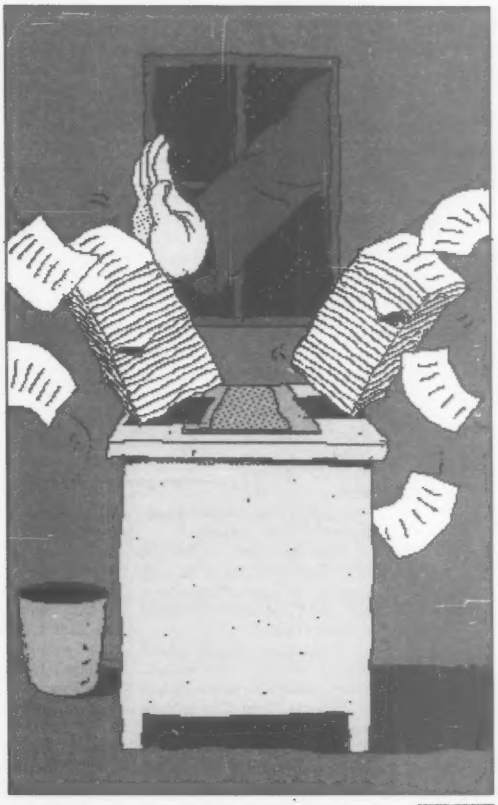
Picture this: A user at a Unix-based workstation on a local-area network downloads information from a VMS-based minicomputer server. Then, from elsewhere on the LAN, he picks up a scanned image from a VMS-based workstation, graphics created on an Apple Computer, Inc. Macintosh workstation and an analysis created on a DOS-based IBM Personal Computer spreadsheet. When he is finished, he sends the whole package as a single document to a printer just by clicking a mouse.

This vision of transparency and unity across platforms, operating systems and applications isn't something that you can touch and hold, but it is what Digital Equipment Corp. expects will develop out of its desktop strategy.

The scheme can be summed up in a single word — integration. Whatever device a user has on his desk, DEC wants to integrate it — through a DEC minicomputer — with all the other devices in the organization.

At the core of the strategy is DEC's Network Applications Support (NAS), a set of software services that allows users and third-party vendors to integrate applications across systems from various vendors in a distributed processing environment. NAS is built on DEC's Application Integration Architecture, which uses both official industry and de facto standards to define the specifications and interfaces for applications under NAS.

One key NAS component is Compound Document Architecture (CDA), a series of specifications that incorporate text, graphics and images from diverse systems into a single document. CDA provides the means for interchanging compound documents across multiple dissimilar platforms and operating systems, including VMS, Ultrix, MS-DOS, OS/2 and Macintosh.



MARK ULRICH

The front-end piece of NAS is Decwindows, an X Window System-based interface that allows users to move transparently between data and applications on otherwise incompatible platforms. Decwindows works with CDA by allowing users to move quickly between applications from which the compound document is being created and to see the various applications on the screen. It allows access to both CDA-compliant and non-CDA-compliant applications.

Decwindows is a desktop product only to the extent that it provides the windowing desktop interface. It is really the entry point into a host of minicomputer-based services that DEC hopes will make its vision of the next generation of desktop computing more compelling.

Despite DEC's recent flurry of desktop hardware offerings — Vaxstations, RISC-based Ultrix workstations, VAX/Ultrix/Decwindows terminals and even remarketed Tandy Corp. MS-DOS machines, most observers believe that DEC no longer harbors any dreams of owning the desktop in a physical sense.

"DEC has recognized that it has lost the battle for physically capturing the desktop," says Peter Schay, program director of small computer systems at Gartner Group, Inc. in Stamford, Conn. Unless it is willing to jump in late in the game by selling Intel Corp. 80286- and 80386-based MS-DOS machines as the low-price leader — a role DEC is unlikely to play — it is too late, Schay suggests, for DEC to claim a significant share of desktop hardware sales.

With NAS, however, DEC seems to have found a rather graceful way of extracting an advantage from a missed opportunity. The underlying philosophy behind DEC's NAS/Decwindows strategy is the recognition of the current multivendor environment and a commitment to embrace whatever technology the user already has — as long as a large VAX or Ultrix device is running the show somewhere in the system.

The ultimate objective of NAS/Decwindows is not to sell software or desktop devices necessarily but to sell VAX and Ultrix hardware — the large minicomputers that will be the servers behind what will become very powerful networks loaded with features.

"It's a question of jostling to make sure that your [architecture] is the system that people are adding to," says John Ganz, executive vice-president at TFS, Inc. in Westford, Mass. "It's the difference between having the VAX as a departmental computer feeding data into an IBM-dominated organization or having the VAX as the central architecture in a system that includes devices from IBM and others."

In the latter scenario, Ganz

Radding is a Newton, Mass.-based author specializing in business and technology.

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The popularity of Ultrix is coloring the future of VMS. Page 66.

Meaningful Exchange
VAX-to-IBM connections reach new levels of sharing. Page 68.

No Pushover
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Desktop

FROM PREVIOUS PAGE

points out, every device integrated into the system increases the need for a bigger VAX. The more applications and devices that NAS/Decwindows embraces, the greater the need for extra VAX or Ultrix power at the center of the system.

"You're providing services that fuel demand for more capacity," he concludes. If the desktop devices are Vaxstations, Decwindows terminals or Ultrix workstations, so much the better for DEC. If the desktop devices come from Sun Microsystems Inc. or IBM or anyone else, DEC still gets to provide applications and the software to integrate them all, which in turn will require a bigger VAX at the center.

Open arms

Although long a staunch defender of the proprietary route, DEC has gone out of its way to ensure compatability with other vendors' products. It has become an active participant in the Open Software Foundation (OSF). The Decwindows tool kit and DEC's X user interface language were selected as part of OSF's Motif X-Windows user interface, and DEC has announced its intention to support Motif when it is shipped.

Because Decwindows embraces industry standards through Motif, users can tie into NAS and access applications and data regardless of what devices are sitting on their desktops. The system already encompasses a variety of PCs, terminals and workstations.

These currently include DEC reduced instruction-set computing (RISC)-based Ultrix and other Unix workstations, VMS Vaxstations, Macintoshes and DOS-based PCs; in time, it will also support PCs running OS/2.

If all of this sounds vaguely familiar, that is because NAS is being positioned as DEC's alternative to IBM's Systems Application Architecture (SAA) and OS/2 Presentation Manager.

But while NAS/Decwindows and SAA and Presentation Manager are both aiming at the integration of multiple technologies within a single, accessible standard, their approaches differ significantly. Although IBM is trying to achieve integration within its own vast and diverse product line, DEC is already integrating its more unified product lines with non-DEC technologies.

In this race, DEC clearly has the lead.

"You can think of Decwindows as the equivalent of Presentation Manager, but the difference is that Presentation Manager is not running on all SAA platforms," points out Michael Millikin, vice-president of Patricia Seybold's Office Computing Group in Boston. Decwindows, by comparison, already runs across the entire VAX/VMS and Ultrix product lines.

"DEC sees holes in IBM's strategy. IBM is forcing users to upgrade to OS/2, and it's excluding Mac, Unix and DEC," Schay points out.

> ALTHOUGH IBM is trying to achieve integration within its own product line, DEC is already integrating its more unified product lines with non-DEC technologies.

The NAS/Decwindows strategy clearly leapfrogs anything IBM has done with SAA or Presentation Manager, according to Peter Kastner, vice-president of the Boston-based Aberdeen Group.

"DEC can already claim they have [transparent computing] from the desk to the data center. SAA won't have that for many years," Kastner explains. Instead of viewing NAS/Decwindows as DEC's version of SAA, Kastner suggests that DEC has already taken the next step by recognizing the multivendor environment; with SAA, he says, "IBM is still trying to plug IBM stuff together."

While DEC may have jumped into an early lead with NAS/Decwindows, that does not mean that the race has been decided. DEC has a number of obstacles to overcome before Decwindows becomes widespread, even within the loyal DEC user base.

One major question mark concerns the amount of computer power required on the desktop to really take advantage of Decwindows.

Questions also remain about the enthusiasm of independent software vendors in developing products for the Decwindows environment.

The amount of desktop computer power required to use Decwindows is a serious obstacle, at least for now.

DEC even warns that "developers who want their Decwindows products to be accessible on PCs should keep in mind the memory and display limitations of personal computers." Jake Van Noy, the Decwindows program architect, adds, "Our starting point is the high-end PC." In some cases, the strength of a bit-mapped graphics workstation is needed.

Users who expect to find the fast windowing possible with stand-alone applications on a high-end PC or Unix workstation are disappointed.

"It is not fast, unless you have tons of memory," says Richard Silber, assistant vice-president at Bankers Trust Co. in New York. He runs Decwindows on his Vaxstation 2000 with 8M bytes of memory and finds that "it is not enough — it's very slow." As a result, he says, only two people at Bankers Trust are using Decwindows, primarily as a window into the main CPU.

"We don't know where to apply it in our financial environment. Right now, it's not very useful — it's sort of a pretty toy," Silber points out.

The problem, Kastner explains, is that "it takes a lot of software to move icons, and that, in turn, requires a lot of MIPS."

"You need at least 6M bytes on the user's desk to do anything with Decwindows," says Charles Babcock, editor of Boston-based *Digital News*.

Of course, in this regard, DEC's problem is no different from IBM's. OS/2 and Presentation Manager also require hefty desktop devices, typically high-end, 386-based PCs with high-resolution graphics capabilities. Decwindows "can be an alternative to OS/2," Millikin points out. "It is a good option for 32-bit machines" on a VAX or Ultrix network.

DEC contends that even users with a dumb terminal can take advantage of NAS/Decwindows. In such cases, the applications run on the central VAX or Ultrix server.

"Not everyone needs a workstation," insists Mike Mancuso, group marketing manager of DEC's independent software vendor group.

Furthermore, Mancuso says, DEC has announced a terminal to support Decwindows that will be priced at less than $3,000.

The third-party push

The biggest obstacle — and what many people consider crucial to DEC's success — is the development of a substantial library of third-party applications. DEC must get "the big name, end-user vendors," Schay says, to make Decwindows the platform of choice.

Right now, DEC's best shot for quick release of applications is its existing team of third-party vendors. According to Mancuso, DEC has trained more than 700 software vendors since it began Decwindows training programs in Dec. 1987, 13 months before it officially announced the product. As a result, Mancuso estimates that 150 applications are currently shipping on Decwindows.

DEC realizes, however, that it has to reach further afield to achieve real impact; through Mancuso's group, it is putting a full-court press on the independent software vendors in a concerted effort to get third-party applications for the Decwindows environment.

Probably DEC's biggest win among independent software providers is Oracle Corp., which has a strategy of porting its products to many platforms and has the resources to do it. According to Brian Owen, senior director of Oracle's DEC products division, the company intends to demonstrate a Decwindows product this fall.

For instance, Mancuso notes that both Ashton-Tate Corp. and Lotus Development Corp., two major PC product vendors that have never worked in the DEC environment, are both involved in Decwindows product development.

At Ashton-Tate, at least, the deal seems firm. Based on an agreement between DEC and Ashton-Tate announced last October, the software developer will develop Dbase for the VAX, VAX SQL services and NAS products. "Ashton-Tate is committed to the VAX environment and Unix," says Ken Rhie, Ashton-Tate's Dbase IV marketing manager for Unix and VAX systems. "We will support all elements of NAS, including CDA and Decwindows."

In the case of Lotus, things are a bit fuzzier. Last November, the company announced a commitment to VAX/VMS, including Decwindows; a variety of unnamed DEC products are under development at Lotus, but no timetables have been announced.

Analysts suggest that Decwindows is not a high priority at companies such as Lotus that are firmly entrenched in the IBM market. Before there is a Decwindows version of 1-2-3, Lotus will first get out an IBM mainframe version of 1-2-3 and other products. "Lotus says all the right things, but they have a lot

What's here now

DEC has made available a number of Network Application Support services during the last 18 months. The following is a list of what is currently being offered and where each piece fits in the strategy.

Applications Access
Terminal Services (Jan. 1988)
- VT emulation across all platforms

Windowing Services (Jan. 1989)
- Decwindows on VMS, Ultrix
- MS-DOS (display facility)

Application Control Services (Jan. 1989)
- Livelink
- Builder

Forms Services (April 1989)
- Decforms

Graphics Services (April 1989)
- DEC GKS
- DEC PHIGS

Information Resource Sharing
File Sharing Services (Jan. 1988)
- VMS Services for MS-DOS
- All-In-1 File Cabinet
- NFS for Ultrix
- VMS/Ultrix Connection

Compound Document Services (Jan. 1989)
- CDA Toolkit
- CDA Viewers
- Decimage Applications Services
- CDA Converter Library (July 1989)

Repository/Dictionary Services (April 1989)
- CDD/Plus

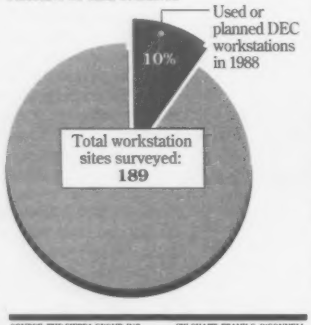
Data Access Services (July 1989)
- SQL/Services

Print Services (July 1989)
- Decprint across all services

Communications
Messaging Services (Jan. 1988)
- Mailbus

They're working on it

DEC machines made up only 10% of workstation installations at the end of 1988, but the installed base is expected to grow 45% by the end of 1989



SOURCE: THE SIERRA GROUP, INC. CW CHART: FRANK C. O'CONNELL

of other things on their plate," Schay points out.

Getting past the IBM block is no easy trick in a lot of cases. Presented with the choice of developing for NAS and Decwindows or OS/2 and Presentation Manager, many vendors decide "OS/2-Presentation Manager is a higher priority," Schay says.

Say when

That's the decision that Ed Harris has reached. "We are interested in Decwindows, but [when we get around to developing a product for it] is a question of timing," says Harris, chairman of Persoft, Inc., developer of the Smarterm line of terminal emulation products.

"We have champions of the Mac, Presentation Manager and Unix here," Harris says, but when push comes to shove, the priority almost invariably has to be OS/2 first. "With IBM and Microsoft behind it, [OS/2] is a gamble you have to take."

"Coding to a graphical interface borders on rocket science. It is very difficult and time-consuming," Kastner explains. As a result, most developers have to be cautious about where and when they commit their limited resources.

Compatibility with X Window and Motif may well be a critical deciding factor in how well DEC does with independents. Some vendors are jumping onto the X Window and Motif bandwagons with the expectation that those standards will suffice for users who want to implement their products in a Decwindows environment. Applications written for Motif can run under Decwindows with minor modifications, according to Motif spokeswoman Donna Ruane.

"Decwindows by itself is not important. Our focus is Motif," says Stephen Hill, executive director of product marketing at Informix Software, Inc.

"Decwindows to us means X Window, and we're committed to X Window," adds Bart Rogers, vice-president of new product development at Synercom Technology, Inc., a georelational information management systems software vendor.

Unix and Motif almost assuredly have a place in the desktop computing technology of the future. As long as Decwindows stays close to these standards, users and developers will be assured that they are not going too far out on a limb.

Right now, it seems that DEC will got to any lengths in order to prove just how accommodating it can be. It has, after all, publicly committed itself to supporting OS/2 when that operating system becomes popular. While that isn't exactly a crystal-clear timetable, it represents a major policy shift. Having been put in the position of watching the first generation of desktop computing from the sidelines, DEC seems determined not be left out again. ●

ASK THE VENDOR

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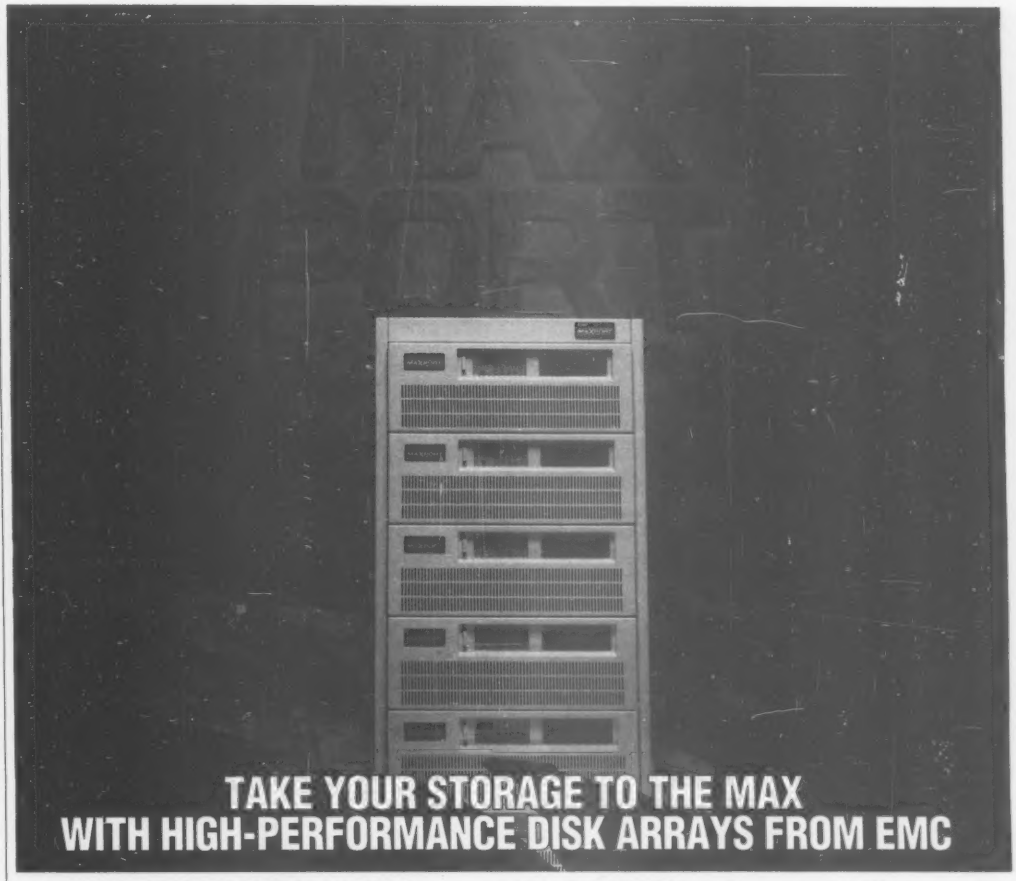

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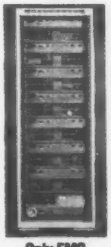

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Come Ultrix, go VMS?

BY TERRY C. SHANNON

For more than a decade, Digital Equipment Corp.'s business strategy has been reflected by the firm's "one architecture, one operating system" VAX/VMS marketing slogan. But not any more — now, there are two operating systems, two architectures and hints of a new tilt in the orientation of the VAX line.

Responding to both competitive and customer pressures, DEC has embraced Unix and open systems with an almost religious fervor. Ultrix-32, DEC's implementation of Unix, now receives equal billing with VMS. In addition, with the advent of the reduced instruction set computing (RISC)-based Decsystem product line, Ultrix has become the only operating system that runs on both of DEC's strategic hardware platforms.

In the new scheme of things, Ultrix and VMS are cast as complementary equals in a "unified computing environment," with RISC-based Ultrix systems delivering maximum price/performance while VAX/VMS systems deliver maximum functionality.

Today, the goal seems to be to make the two operating systems as similar as possible. As DEC aggressively adds features and functionality to Ultrix, the list of differentiating attributes gets smaller.

For example, recent Ultrix releases have incorporated clustering and improved system management capabilities, and DEC has promised to add symmetric multiprocessing support to Ultrix before year's end. Waiting in the wings is Ultrix support for DEC's forthcoming VAX 6000 and 9000 vector processing options.

Ultrix will also soon match VMS in operating system security. The VAX Secure Virtual System, a maximum-security operating system kernel that will endow both VMS and Ultrix with Department of Defense A1 security capabilities, is slated for field-testing in the near future.

In addition, there is an Ultrix implementation in development that will deliver secure windowing capabilities and operating system security to a forthcoming Secure Ultrix workstation.

Finally, DEC's Decwindows integration program will resolve the Ultrix user interface issue. By endowing Ultrix with a consistent, transparent graphical interface, Decwindows will render invisible the cryptic and user-unfriendly Ultrix command interface.

Shannon is director of the DEC Advisory Service at International Data Corp. in Framingham, Mass.

The DEC difference

What we are seeing now is just one phase in a larger plan, however. VMS and Ultrix appear to be moving toward intersection, and DEC has explored the feasibility of merging the two. However, it is more likely that the company will soon turn its attention to the enrichment of its proprietary operating system for commercial applications.

AS DEC INCREASES its efforts to penetrate the commercial computing arena, on-line transaction processing capabilities are likely to emerge as a key distinction between VMS and Ultrix.

DEC's ability to distinguish VMS and any follow-ons from an industry-standard and ostensibly hardware-independent operating system will be crucial to the company's continued account control.

DEC's short-term VMS strategy will emphasize the value-added capabilities that make VMS suitable for commercial applications. VMS will be positioned as the operating system of choice for applications that require high availability, data integrity and redundancy, support for large databases and distributed processing as well as on-line transaction processing (OLTP) capabilities.

Grooming for OLTP

By casting VMS as a solid, production-quality operating system, DEC is grooming its proprietary VAX system software offering to serve as the linchpin of the developing DECTP on-line transaction processing strategy. Indeed, as DEC increases its efforts to penetrate the commercial computing arena, OLTP capabilities are likely to emerge as a key distinction between VMS and Ultrix.

Coming to VMS in the early 1990s under the aegis of the Digital Distributed Transaction Processing Architecture is a trio of OLTP-critical operating system functions that will also distinguish VMS from its open systems counterpart.

These features, which will form the basis of a VMS transaction processing kernel, include a distributed transaction manager, remote procedure call support and a recoverable resource manager.

Over the longer term, it is reasonable to expect that the need to support intended addressing as well as vector and

Continued on page 69

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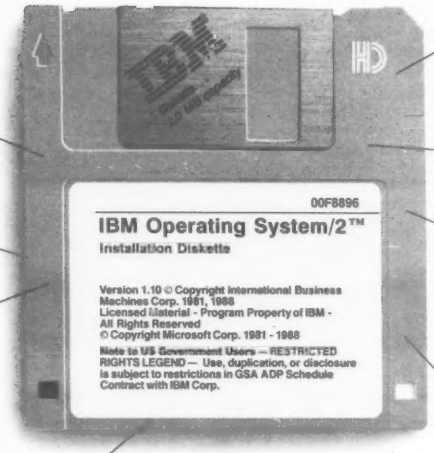

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Closing the VAX-to-IBM gap

BY PAUL LI and MARVIN CHARTOFF

The rise in departmental computing has created a corporate conundrum. While Digital Equipment Corp. VAX machines proliferate on the departmental front, IBM machines continue to dominate the corporate environment as a whole. With the current move toward distributed databases and cooperative processing, these disparate architectures need to coexist. Third-party vendors have responded to this need with add-on products to connect VAXs with a full range of IBM mainframes, minis and micros.

Li is a senior consultant and Chartoff a senior manager at Ernst & Young in Fairfax, Va.

In the last decade, VAX-to-IBM mainframe connectivity has evolved from remote job entry and terminal emulation to peer-to-peer networking. About 20 products are available for VAX-to-IBM mainframe access; these can be grouped on the basis of cost, capacity and functionality.

The low-end products, priced at less than $20,000, are ideally suited for users who require simple low-speed connection between their DEC and IBM computers for tasks such as moderate-volume file transfer between regional offices. Products in this category typically provide a transfer rate up to 19.2K bit/sec. Generally, they are oriented toward batch transfer or terminal emulation, providing simple point-to-point connections, and most employ VAX-based software or add-in boards. These products include Joiner Associates' Jnet and Century Computing's Comm 100 software and Simpact Associates' CPI and Software Results Corp.'s Comboard cards. Additional hardware cards can boost the transfer rate to 56K bit/sec.

In the midrange — priced from $20,000 to $50,000 — a 56K bit/sec. transfer rate is typical. At this level, products provide increased functionality by implementing peer-to-peer sessions between DEC and IBM computers via IBM's LU6.2 protocol.

Products representative of this class include Systems Strategies, Inc.'s Vaxlink and DEC's own VMS/SNA software. A few packages, such as Spectrum Concepts' Xcom 6.2, require software running on both the VAX and the mainframe, which allows them to achieve higher transfer rates and increased flexibility. Here, the typical user for this level of connection can maintain a shared database for a facility requiring interactive access to central information.

At the top end of DEC-to-IBM mainframe connectivity products are the high-speed, I/O channel-attached products priced at more than $50,000. Products in this category include Interlink Computer Services' 3711 and 3732 gateways and Flexlink International Corp.'s Flexlink (with Fastpath).

The high-end products typically support both Decnet and Open Systems Interconnect (OSI) protocols and provide a transfer rate on the order of megabits per second. Most require additional software on the mainframe or the VAX or an additional hardware "box" that interconnects the two. These products also require that both CPUs be centrally located. Large corporations that need to transfer large volumes of data, such as manufacturers collecting departmental data for a central database, would be typical users of these products.

Limited edition

In the past few years, roughly a half-dozen products have become available to connect VAXs and IBM minicomputers, such as Application System/400s and System/36 and 38s.

One reason for the limited supply is that demand for this type of connectivity is only beginning to develop. Most departments standardize on one type of machine; until recently, if they needed interdepartmental connectivity, departments would use the corporate mainframe as an intermediary. Corporate interest in sharing information between departments has created a demand for direct connections between these machines.

Two types of products are currently

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41. Engineering, Scientific, R&D, Tech. Mgt.
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available in this category — one provides VAX-to-AS/400 and System/36 and 38 connection, the other connects VAXs only to AS/400s. Both are priced in the $10,000-$20,000 range and are oriented toward peer-to-peer communications.

Products of the first type, which include Joiner's BSC/400, Simpact's CPI 12300 and Datanex, Inc.'s Exlink, interconnect the VAX to either an AS/400 or a System/36 or 38. These products require software or hardware board additions to the VAX.

Typically, products in the second group allows bidirectional file transfer but require an external hardware interface that connects to an AS/400 on a Token-Ring via LU6.2 and to a VAX on Ethernet via DEC's Data Access Protocol.

Best of both worlds

In the VAX-to-IBM micro sector, a new generation of products is emerging that is geared toward using the VAX as a local-area network server. These products allow PCs to continue to operate in their own LAN environment while taking advantage of VAX-based services such as printing and filing. Roughly a dozen products, priced from $5,000 to $20,000, currently fill this niche.

Offerings in this group include server versions of popular LAN operating systems, such as Novell, Inc.'s Netware VMS and Ungermann-Bass, Inc.'s Net/One NIU-DHS. VAX server products, such as Technologies Concepts, Inc.'s Community-DOS, Interlan's NP 647 and DEC's own Personal Computer Support Architecture, are also part of this group.

This area of DEC-IBM connectivity is still coming into its own. The advent of IBM's LAN Manager and OS/2, with their increased distributed processing capabilities, will help this segment to evolve from direct machine connections to more advanced LAN-to-LAN links during the next several years.

User demand for standards is steering DEC, IBM and other computer vendors toward OSI protocols, a move that could push many of today's products into obsolescence. While the current crop of VAX-to-IBM products is sufficient to meet current connectivity requirements, it is critical that corporations treat DEC-IBM connectivity within the context of long-term strategic network planning. •

DEC service slice leaves third-party pickings slim

BY BARBARA SEHR

Maintaining and servicing Digital Equipment Corp. computers and peripherals is good work — if you can get it.

DEC users pay out $2.1 billion annually in maintenance charges, an especially inviting figure for third-party service providers now that IBM has decided to play hardball in the maintenance area.

"Since IBM has become very aggressive in its merchandising of maintenance plans, many third-party service providers are likely to focus on DEC," points out Pamela Kline, vice-president of Prognostics, Inc., a San Francisco market research firm.

Such hopefuls may find, however, that DEC can be a tough competitor. Currently, more than 70% of the money DEC users pay for maintenance goes directly to DEC, notes Rebecca Segal, director of the customer services program at International Data Corp. in Framingham, Mass.

Not much left over

That does not leave a large slice of the pie for third-party providers, which must share the remaining 30% with peripherals vendors and systems houses. Furthermore, that is exactly the way that DEC would like to see things stay.

According to Kline, maintenance income represents 32% of DEC's total revenue, so — not surprisingly — the company tends to be protective of its interests. For third-party maintenance providers to increase their share, they must overcome a number of DEC-erected hurdles.

One obstacle is that DEC has developed proprietary diagnostic tools for its new generations of VAX hardware that are available only to its own maintenance force. Another is the way that the company has bundled its hardware and software maintenance contracts so that users cannot choose different sources for hardware and software. "They've done everything possible to close the door on third-party providers," Kline says.

Still, third-party providers are not taking DEC's closed-door policy as the final word on their prospects. DEC may be trying to limit entry, they say, but other factors such as open architectures and local-area networks are creating openings.

Third-party providers have other weapons at their disposal, Kline notes. TRW, Inc. has rewritten DEC's documentation in clearer terms and offered it to its customers. Sorbus, Inc. has acquired several systems integration firms in order to improve its in-house VAX expertise. Other providers have improved their user hand-holding services.

That extra measure of effort can pay off. Doug Grover, operations manager at the Indiana University computing center, says the combination of a threatened price increase and existing discontent convinced him to turn from DEC to Control Data Corp. in 1984. "We didn't see a particular return on the dollar," he says. "Instead of preventive maintenance, we were getting reactive maintenance."

Grover says CDC services most of the university's 50 DEC systems, ranging from the new Vaxstation 2000 to several 8600s and older VAX-11/780s. DEC still provides warranty service and a small amount of contract maintenance.

In the past five years, Grover says he has seen a dramatic improvement in DEC service. Still, he maintains, "All things being even, if DEC were to offer the same price as CDC, we would stick with CDC."

At Jeppesen-Sanderson in Englewood, Colo., third-party service is still something of a novelty. So far, only one of the company's four VAX systems is maintained by an independent service provider. Dale Bastian, a computer support analyst, says money and versatility were the primary factors in choosing Sorbus over DEC.

In addition to a better price, Bastian says Sorbus gives Jeppesen-Sanderson better coverage for both the VAX system and its networked micros. "With Sorbus, we could get more under one blanket," he explains.

Jeppesen-Sanderson, which makes navigational aids for commercial airlines, is a multiple-vendor system site. In addition to its four VAX systems, the company maintains an IBM mainframe and hundreds of PCs. The systems vary further: Two of the VAXs installed are dedicated graphics systems from Intergraph, a graphics systems house that maintains the stations itself. A fourth VAX is still under warranty and therefore maintained by DEC. That leaves just one VAX and many PCs for Sorbus to maintain.

This arrangement is still in its first year; Bastian says that no decisions have been made about expanding the program.

Cultivated loyalty

Despite the prospects for growth in third-party maintenance, strong loyalties remain in the DEC market. "Maintenance is a lot more than fixing boxes when they are broken," says Daniel Marchiori, director of multiple systems support at the United Service Automobile Association (USAA), a major national insurance carrier.

USAA is a prime example of the kind of customer that DEC likes to coddle and cultivate and that is, as a result, virtually impervious to third-party blandishment. The carrier is a large-scale DEC user, with five large Vaxclusters, two additional Microvaxes and 2,500 terminals that connect 3,400 users. As such, it is able to negotiate favorable rates and better treatment.

"We negotiate annual service contracts as a volume user," Marchiori says. "We don't pay the listed service contract prices. We have a lot of influence on DEC."

Among the things that this kind of influence can buy are an on-site DEC maintenance person and a nearby parts source. There is, Marchiori observes, no way that a third-party maintenance firm could compete for USAA's business on the basis of responsiveness. •

Sehr is a free-lance writer based in Mountain View, Calif.

Ultrix

CONTINUED FROM PAGE 66

parallel processing will cause DEC to supplant the current VAX architecture with a next-generation hardware platform and to recast VMS as a new native operating system capable of carrying the company into the next millennium.

DEC has tacitly acknowledged the feasibility (if not the inevitability) of such a next-generation hardware platform by indicating that the VAX architecture will undergo radical evolutionary changes — including the incorporation of RISC-like features — during the next several years.

The native operating system developed in conjunction with DEC's Prism RISC processor project could shed light on the proprietary operating system that will accompany the new VAX.

The Mica base system was to have included vectorizing and decomposing compilers, host-based disk striping and shadowing, symmetric multiprocessing and dynamic processor reconfiguration to ensure maximum system availability. Less demanding workstation and technical applications were to have been addressed by a Prism implementation of Ultrix.

Not only did Mica's two key application areas — OLTP and scientific/technical computing — mirror critical VMS applications, but the native RISC operating system included VMS compatibility mode and system service emulation capabilities. Collectively, these features would have enabled DEC to evolve its next-generation operating system from an adjunct to VMS to a replacement.

Although DEC's decision to base its RISC product family on the Mips Computer Systems, Inc. RISC architecture resulted in the cancellation of Prism, the Mica applications and positioning strategy should be equally developed to support a future VAX architecture that incorporates RISC technology. The timing of this next-generation system is hard to predict, but it is almost certain that a VAX/VMS sequel looms large in DEC's future. •

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DEC hardware maintenance providers

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ABS Associates, Inc. (312) 577-7726	Microvax, PDP-11, Decmate, printers, terminals	Yes	U.S.	8-6[1]	25	5,000	Both	1 dispatch/ 1 depot	3-5 days	1 hour-1 day	Yes	Yes	Both	Yes	Yes	Annual prepayment, multi-year, volume discount	$65 depot/ $85 on-site
Adahl, Inc. (315) 656-3968	All DEC hardware	No	50-mile radius of Syracuse	9-5	3	1	Both	1 dispatch/ 1 depot	2-3 days	4 hours	No	Yes	Neither	Yes	No	None	$50 depot/ $70 on-site
Advanced Data Support Systems, Inc. (908) 327-2118	PDP-11, peripherals	Yes	Southern Calif.	8-5	3	12	Both	1 dispatch/ 1 depot	1 day	4 hours	Yes	No	Consulting	Yes	No	Educational	$45 depot/ $75 on-site
American Computer Engineers (619) 587-9003	VAX-11/780, Microvax, PDP-11, Vaxmate, Decmate	No	Southwestern U.S., Baja Mexico	8-5:30	7	50	Both	1 dispatch/ 1 depot	3-5 days	2-4 hours	Yes	Yes	Both	Yes	Yes	University, government, multiple system, 24-hour response	NP
American Electronics, Inc. of Columbia (803) 353-4738	LA36 and 120, VT100 and 200 series	No	50-mile radius of Columbia, S.C.	8-5	3	30	Both	1 dispatch/ 1 depot	7 days	4 hours	No	Yes	Neither	Yes	No	Volume	$50 depot/ $50 on-site
Bell Technical Services (416) 491-9606	PDP, Microvax, VAX-11/700 series	Yes	Canada	24 hours/ 7 days	350	66	On-site	5 dispatch/ 45 service locations	NA	4 hours within 50km, 2 hours upon request in some areas	Yes	No	Consulting	Yes	No	Volume and business case based	$100 on-site
BPS, Inc. (602) 966-1192	Terminals, printers, PCs	No	Ariz.	8-5 (24-hours/ 7 days available)	13	500	Both	3 dispatch/ 3 depot	4 hours	2 hours	No	Yes	Neither	Yes	Yes	Prepayment	$40 depot/ $65 on-site
Burk's Computer Service (716) 325-5048	All DEC hardware	No	Western N.Y.	9-5	2	4	Both	1 dispatch/ 1 depot	8 hours	4-8 hours	Yes	Yes	Both	Yes	Yes	Volume	$65 depot/ $75 on-site
Chana, Inc. (305) 373-6133	All printers and terminals	No	U.S. (depot), Cuba (on-site)	8-5	10	200-250	Both	1 dispatch/ 1 depot	2-4 days	4 hours	Yes	Yes	Both	Yes	No	10%-30% prepayment, annual contracts	$50-$90 depot/$60-$90 on-site
Cirvis, Inc. (718) 891-2006	LA50, 100, 120, PCs	No	Southern Calif.	8-5	4	30	Both	1 dispatch/ 1 depot	Up to 10 days	4 hours	Yes	No	No	Yes	No	15%-35%	$65 depot/ $70 on-site
CJV Enterprises, Inc. (305) 491-1500	Terminals, printers	No	Southeast Fla.	8-5	3	2	Both	1 dispatch/ 1 depot	1-2 days	2-8 hours	Yes	Yes	Consulting	Yes	No	Volume	$50 depot/ $75 on-site
Compucom Corp. (303) 377-0020	PDP-11, LSI-11, MicroPDP-11, Microvax series, VAX-11/700 series	No	Denver, Chicago (100-mile radius)	8-5	5	65	Both	2 dispatch/ 1 depot	5 days	4 hours	Yes	Yes	Consulting	Yes	Yes	NP	$60 depot/ $90 on-site
Compufix Computer Repair Depots (714) 641-1355	All PC-related, printers, depot systems/ component level	Yes	Calif.	8-6 (10-5 Sat.)	2	5	Both	3 dispatch/ 3 depot	2-3 days	4 hours	Yes	No	Both	Yes	No	Copyrighted Time Block contracts	Depot and on-site: $45 (contract), $55-$75 (noncontract)
Compu-Fix, Inc. (412) 464-0275	VAX, PDP-11, Microvax II and 3000, Vaxmate	No	Southwest Pa., northwest Va., eastern Ohio	24 hours/ 7 days	8	150	Both	1 dispatch/ 1 depot	2 days	4 hours	Yes	Yes	Both	Yes	Yes	3 year, early payment, prepayment	Depot and on-site: $65
Computer CRT, Inc. (800) 635-0030	PDP-11, all peripheral and disk drives	No	Southwest Wash., Portland to Eugene, Ore.	8-5	4	12	Both	1 dispatch/ 1 depot	3-5 days	24 hours, 1 hour by phone	No	Yes	Consulting	Yes	No	20%-25%	$50-$80 depot/$70 on-site (1-hour min.)
Computer Field Services (508) 664-2825	Peripheral hardware	No	New England	9-5	2	400	Both	1 dispatch/ 1 depot	3 days	5 hours	No	No	Neither	Yes	Yes	None	$65 depot/ $85 on-site
Computer Maintenance Corp./Southern Digital Services, Inc. (404) 449-3330	Vaxstation, VAX-11/700 series, Microvax II, PDP-11	Yes	Atlanta, Washington, D.C., Winston-Salem, N.C.	24 hours/ 7 days	NP	NP	Both	2 dispatch/ 2 depot	NA	4 hours	No	Yes	Neither	Yes	No	25%-30%	$90 on-site
Computer Network Solutions (617) 275-5400	Microvax II, PDP-11, terminals, printers	No	New England	8:30-5:30 (special contracts available)	6	10	Both	1 dispatch/ 4 depot	1-2 days	4-8 hours	No	Yes	Both	Yes	No	Volume	$45 depot/ $60 on-site
Computer Service Network (800) 777-4884	All monitors, dot matrix printers, microcomputers, some VAX systems	No	U.S., Canada	8 and 24 hours/ 7 days	1,500	1,500	Both	1 dispatch/ 350 depot	3 days	Same day, next day, 4 hours	Yes	No	No	Yes	Yes	Depending on site/location/ numbers	$65 depot/ $100 on-site
Comsel Corp. (703) 734-5800	VT series, LA series, laser printers, Decmate	No	Va., Md., D.C.	8:30-5	9	300	Both	1 dispatch/ 1 depot	3 days	24 hours; 4 hours average	No	Yes	Training	Yes	Yes	Reseller, volume	$75
Control Data Corp. (800) 345-9963	PDP-11, VAX-11/700 series, VAX 8000 series, Microvax II and 3000, Vaxstation 3000	Yes	U.S.	7-6 p.m. (24 hours/ 7 days available)	NP	NP	On-site	1 dispatch/ 103 service centers	NA	4 hours	Yes	No	Consulting	Yes	No	Volume price adjustments	$110/on-site (non-contractual)
Cosmic Enterprises, Inc. (508) 435-0907	PDP-11, VAX-11/700 series, 8000 series, Microvax II series, 3500-3600, Vaxstations, workstations	No	New England, Mid-Atlantic, Southern Fla.	8:15-5 (24 hours/ 7 days available)	14	145	Both	2 dispatch/ 2 depot	5-10 days	2 and 4 hour and same day	Yes	Yes	Both	Yes	Yes	Multisystem, municipal, government, educational, hospital	$60 depot/ $75 on-site (2-hour min.)
Data Entry, Inc. (407) 230-0062	Micro PDP-11, Microvax, all printers and terminals	No	Fla.	8-5	4	20	Both	1 dispatch/ 1 depot	5 days	4 hours	No	Yes	Neither	Yes	No	None	$75 depot/ $95 on-site
Data Equipment Service, Inc. (301) 444-0500	PDP-11 series, VAX-11/700 series, Microvax II, Microvax 3000 series	No	Northern Va., York, Pa., Baltimore, Washington, D.C.	8:30-5 (24 hours/ 7 days available)	6	90	Both	1 dispatch/ 1 depot	2 days	4 hours	No	Yes	Consulting	Yes	Yes	Multisystem, prepaid	$70 depot/ $100 on-site

[1]Hours given are for Monday through Friday unless otherwise noted.

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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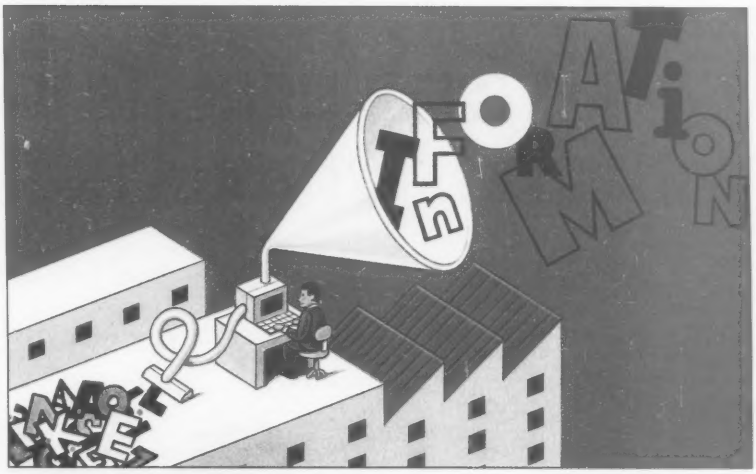
Data Repair Services and Sales (617) 932-0660	LN03 series, LK201 series, LA50 printer series, VT 100 and 220 series	NP	Eastern Mass.	8:30-5	2	52	Both	1 dispatch/ 1 depot	2 days	4 hours for contract customers	No	No	Neither	Yes	No	Volume	$56 depot/ $75 on-site
Data Storage Technology, Inc. (714) 730-0722	PDP-11, Microvax II, 2000, 3000, VAX-11/700 series, VAX 8250 and 8300	Yes	Southern Calif.	24 hours/ 7 days	10	110	Both	7 dispatch/ 3 depot	10 days	4-8 hours	No	Yes	Consulting	Yes	Yes	Multisystem, multioption	$45 depot/ $85 on-site
Datagroducts (603) 673-9100	LP printer series, LE 8	No	U.S.	7-5	10	500	Depot	2 depot	10 days	NA	NA	Yes	Training	Yes	Yes	Volume per month	$50
Datatech Systems Ltd. (416) 673-1119	PDP-11, VAX-11/700 series, Microvax II and 2000	No	U.S.	24 hours/ 7 days	100	250	Both	22 dispatch/ 15 depot	2 days	2 hours	Yes	Yes	Consulting	Yes	Yes	20%-30%	$60 depot/ $80 (peripherals), $100 (systems) on-site
Datec, Inc. (206) 575-1470	VT100, 220, 240; VR241, 301 terminals; LN03; LQP02, 3, 45; LA120, 36, 100, 210 printers; Rainbow 100, Decmate II and III	No	Seattle, Portland, Ore.	8-4:30	8	1,000	Both	1 dispatch/ 2 depot	3 days	4 hours	Yes	Yes	NP	Yes	No	Volume, prepayment	$60 depot (1-hour min.)/ $90 on-site (1-hour min.)
Decision Data Service, Inc. (800) 654-3374	PDP-11, VAX-11/700 series, Microvax II	NP	West and East Coasts	8-5 (24 hours/ 7 days available)	15	100	On-site	2 dispatch	NA	2-4 hours	Yes	No	Consulting	Yes	No	GSA, multiyear, single point of billing	$150 on-site (time and material)
Delnet, Inc. (301) 208-8161	Decmates, terminals	No	Baltimore, Washington, D.C., Va. metropolitain area	8:30-5	3	50	Both	1 dispatch/ 1 depot	1 week	8 hours to next day	Yes	Yes	Neither	Yes	Yes	Volume	$35 depot/ $65 on-site
Digital Equipment Corp. (508) 870-3111	All DEC hardware and peripherals	Yes	Worldwide	24 hours	13,000 (U.S.), 27,000 (worldwide)	560,000	Both	200 service locations/ 163 carry-in centers	2 days	2-4 hours for high-end systems	Yes	No	Both	Yes	Yes	None	NP
Distributed Logic Corp. (DiLog) (714) 937-5700	PDP-11, Microvax, most DEC-compatible peripherals	No	U.S.	9-5 (other hours negotiable)	22	400	Both	3 dispatch/ 1 depot	30 days	8 hours, others available	No	Yes	Both	Yes	Yes	Volume	NP
Dow Jones & Co. (800) 922-0358	VT series, Vaxmate, PCs, minicomputers	NP	U.S., Canada	8-5 (24 hours/ 7 days available)	400	1,000	Both	77 dispatch/ 55 depot	3-5 days	4-8 hours, depending on zone	Yes	Yes	Both	Yes	Yes	Volume based on total and/or location	$50 depot/ $84 on-site
DSK Systems, Inc. (201) 499-1111	VAX 8600	Yes	U.S.	8-5	4	1	Both	2 dispatch/ 2 depot	3 days	4 hours	Yes	No	Both	Yes	No	10 days, 2%	$65
Dynaservice Network (415) 732-3060	PDP-11, LSI series, VAX-11/700 series, VAX 8000 series, PCs, terminals, printers	Yes	U.S.	8-5	150	NP	Depot	5 depot	10 days	NA	NA	No	Neither	NA	Yes	Volume	Priced per unit
Efficient Field Service Corp. (508) 251-7000	PDP-11, LSI, VAX-11/700 series, Microvax II and III, GPX, Vaxstations, workstations	No	New England	8-6	23	50	Both	1 dispatch/ 1 depot	5 days or less	4-8 hours	Yes	Yes	Neither	Yes	Yes	Volume	$65 depot/ $95 on-site
Electronic Service Specialists (414) 255-4634	All CPUs and peripherals associated with PDPs, Unibus and VAX through 8800	Yes	Worldwide	8-5 (24 hours emergency parts)	100	NP	Depot	5 depot	5 days	NA	No	Yes	Both	Yes	Yes	Volume	$50 depot
Electroservice Laboratories (602) 644-2044	All DEC motors and spindles	No	Worldwide	8-5	30	NA	Depot	1 depot	10 days (expedite available)	NA	No	No	NA	No	Yes	Volume	Priced per unit
GE Computer Service (800) 543-0440	All DEC hardware	No	U.S., Canada, Puerto Rico	8-5 (24 hours/ 7 days available)	200	1,000	Both	1 dispatch/ 6 depot	20 hours	4 hours	Yes	No	Consulting	NP	No	NP	NP/$110-$127 on-site
Impact (800) 777-4323	Printheads for dot matrix printers	No	U.S., Canada	8-6	4	120	Depot	2 depot	2 days	5 days	Yes	NP	Neither	No	Yes	Volume	Priced per unit
Integrated Computer Services, Inc. (818) 960-1921	PCs, LA39, 50, 36, 120 (printers), VT100, 101, 131, 220, 240, 250 (terminals)	No	Southern Calif. for on-site, U.S. for depot and component repair	8:30-5:30	3	2	Both	2 dispatch/ 2 depot	3 to 5 days	Up to 8 hours	No	Yes	Neither	Yes	Yes	NP	$35 depot/ $65 on-site
Integrated Systems Group, Inc. (800) 847-5880	QBUS, PDP-11, VAX-11/700 series, Microvax II	No	Calif., Ariz.	8-5 (24 hours/ 7 days available)	30	200	Both	1 dispatch/ 1 depot	5 days	4 guaranteed, 2-3 average	Yes	Yes	Consulting	Yes	No	20%-60%	$35 depot/ $80 on-site
International Technical Services, Inc. (609) 424-7880	Micros, printers, terminals, modems	No	N.J., Pa., Del., central Fla.	8-5	7	400-500	Both	1 dispatch/ 1 depot	1 week	4 hours	No	Yes	Neither	Yes	Yes	Volume	$45 depot/ $60 on-site
Jadtec Computer Group (714) 997-0027	PDP-11, VAX-11/700 series, Microvax II and 3000	Yes	L.A., Orange Co., San Bernadino, Riverside, San Diego, Calif.	24 hours/ 7 days	15	300	Both	1 dispatch/ 1 depot	3-5 days	4 hours	Yes	Yes	Both	Yes	Yes	Monthly, quarterly, annual prepayment	$65 depot/ $85 on-site
Juno Technical Services, Inc. (415) 487-7601	LA36, 180, 120, 12, 100, 210 printheads only	No	U.S., Europe	8-5	1	NP	Depot	1 dispatch/ 1 depot	1 to 5 days	NA	No	Yes	NA	Yes	Yes	Volume	NP
Maintech (800) 456-8334	VAX 8200 series, VAX-11/700 series, PDP-11, Microvax II and 3000, Vaxstation II and 3000	No	East Coast, West Coast, Texas	8-8 (24 hours/ 7 days available)	300	NP	On-site	3 dispatch/ 2 depot	NA	4 hours, others available	Yes	Yes	Both	NA	No	Volume, educational, preferred client, local area, next day	$65 ($100 weekends, holidays) on-site
McDonnell Douglas Field Service Co. (800) 838-4944	Microvax I and II, VAX-11/700 series, VAX 8000 series, Vaxstation, PDP-11, LSIs, Rainbow, Decsystem 10, Decsystem 20	No	U.S.	8-5 (24 hours/ 7 days available)	650	2,500	Both	1 dispatch/ 3 depot	4 days-2 weeks	4 hours	Yes	Yes	Both	Yes	No	Volume	$125 on-site (2-hour min.)
Mem Systems (415) 463-9491	All peripherals and spare parts	No	U.S., Europe	8-5	15	400-500	Depot	1 depot	3-5 days	NA	NA	Yes	Consulting	Yes	No	Volume	$45 depot
Multi Computer Systems, Inc. (312) 543-1238	All PDP-11s, all peripherals	No	Chicago metropolitain area	8-5/ Mon.-Sat.	5	NP	Both	1 dispatch/ 1 depot	Next-day service	2-4 hours	Yes	Yes	Neither	Yes	Yes	Volume	$60 depot/ $85 on-site
National Computer Service, Inc. (800)367-6454	PDP-11, VAX, Microvax, associated peripherals	No	U.S.	8-6	147	5	Both	1 dispatch/ 1 depot	1 day for most problems	4 hours	No	Yes	Consulting	Yes	Yes	Volume	$65 depot/ $75 time and materials

COMPANY	TYPES OF DEC HARDWARE SERVICED	ALSO SERVICES SOFTWARE	GEOGRAPHIC AREA	SERVICE HOURS	NUMBER OF SERVICE EMPLOYEES FOR DEC EQUIPMENT	NUMBER OF DEC SYSTEMS UNDER CONTRACT	ON-SITE/ON-DEPOT REPAIR	NUMBER OF DISPATCH AND/OR DEPOT REPAIR CENTERS	AVERAGE DEPOT TURNAROUND TIME (days)	GUARANTEED ON-SITE RESPONSE TIME (hours)	COMPUTERIZED DISPATCHING	LOANER PARTS PROVIDED	CONSULTING/TRAINING PROVIDED	PERMIT CONTRACT CHANGES/ UPDATES	WARRANTY SERVICES	TYPES OF DISCOUNTS	MINIMUM HOURLY RATES FOR DEPOT/ON-SITE REPAIR
Peripheral Maintenance, Inc. (800) 234-9727	VT100, 220, 320 (terminals), LA120, 100, 75 (printers)	No	N.Y., N.J., Del., eastern Conn.	9-5	8	500	Both	1 dispatch/ 1 depot	3-5 days	4 hours	Yes	Yes	Both	Yes	No	Volume contract, depot discounts	$65 depot/ $85 on-site
Peripheral Parts Support, Inc. (617) 891-9101	All DEC hardware	No	U.S., Canada	9-5	5	NP	Depot	2 depot	3-4 days	NA	No	No	NA	Yes	Yes	Volume	Priced per unit
Precision Methods, Inc. (703) 339-7050	All removable disk products	No	U.S.	24 hours/ 7 days	35	1,000	Both	5 dispatch/ 1 depot	1 week	24 hours, dependent on area	No	No	Both	Yes	Yes	Volume	$30 depot/ $100 on-site
PTKI (800) 527-3488	LA printer series, VT terminal series	No	U.S.	8-5	100	1,000	Both	36 dispatch/ 11 depot	NP	4-24 hours (contract), 1-2 days (non-contract)	Yes	Yes	Both	Yes	Yes	Volume, Help desk, location	$65 depot/ $85 on-site (2-hour min.)
Randomex, Inc. (213) 595-8301	Disk packs	No	U.S.	8-5 (24 hours/ 7 days available)	125	500	Both	36 service locations	1 day	8 hours maximum	No	Yes	Consulting	Yes	Yes	Volume	NP
Scopus Corp. (800) 225-0893	All drives, media maintenance and data retrieval for removable and fixed media	No	U.S.	24 hours/ 7 days	18	2,000	Both	1 dispatch/ 1 depot	2 days	12 hours	Yes	Yes	Both	Yes	Yes	Volume	NP
Sentinel Computer Services (312) 998-8060	All DEC hardware	Yes	Ill., Ind., Wisc.	24 hours/ 7 days	20	123	Both	3 dispatch/ 3 depot	3 days	4 hours	Yes	Yes	Both	Yes	Yes	Prepaid, government, multisystem, educational	$55 depot/ $95 on-site
Servitech, Inc. (312) 620-8750	PDP-11 series, Decmate, Rainbow, peripherals	No	Chicago, Milwaukee, Cary, Ill., metropolitan areas	8:30-5 (24 hours/ 7 days available)	3	NA	Both	1 dispatch/ 1 depot	3-5 days	4 hours	Yes	Yes	Neither	Yes	No	Volume	$60 depot/ $150 on-site
Servonics Corp., Unitek Division (508) 295-6372	Terminals, monitors, keyboards, printers	No	U.S. (eastern Mass., pick up and delivery)	8-8 Mon.-Sat.	4	NP	Depot	1 depot	3-7 days	NA	No	No	Neither	Yes	No	Volume	Priced per unit
Serbus (800) 367-4636	PDP-11s, Microvax I and II, VAX-11/700 series, VAX 8000 series	Yes	U.S., Europe, Ca...da	24 hours/ 7 days	NP	NP	Both	200 dispatch/ 200 depot	1 day	4 hours	Yes	Yes	Training	Yes	Yes	NP	NP
Sycom, Inc. (703) 378-6300	PDP-11, VT series, LA series, tape and disk, controllers, cluster controllers	Yes	U.S.	7-7	23	24	Both	2 dispatch/ 5 depot	2 days	2 hours	Yes	Yes	Both	Yes	No	Volume, population density, length of contract	$40 depot/ $70 on-site
TCBC/Computer Mechanic (212) 363-5935	Microvax, Decstation, printers	Yes	N.Y., N.J., Conn.	8:30-5:30 (24 hours/ 7 days available)	15	100	Both	1 dispatch/ 1 depot	2 days	2 hours	Yes	Yes	Both	Yes	Yes	Volume, proximity	$70 depot/ $115 on-site
Talus Field Engineering (801) 298-8000	All hardware through VAX 8800 including PCs, terminals, printers, disks, CPUs	No	U.S.	24 hours/ 7 days	200	5,000	Both	130 dispatch/ 45 depot	2 days	2 hours CPU, 4 hours peripherals	No	Yes	Consulting	Yes	No	Annual prepayment	$40 depot/ $60 on-site
Test Point Technical Services, Inc. (416) 624-0320	PDP-11 series, Microvax II and III, VAX-11/700 series, VAX 8250	No	Canada	24 hours/ 7 days	22	198	Both	4 dispatch/ 2 depot	5 days	2 hours	Yes	Yes	Training	Yes	Yes	Annual prepayment, multiple sites	$65 depot/ $80 on-site
Texas Instruments, Inc. (800) 527-3500	LA75, 100, 120 (printers), VT100, 220, 320 (terminals)	No	U.S.	8-5	NP	NP	Both	1 dispatch/ 40 depot	Next day	9 hours	Yes	No	Neither	Yes	No	Volume	$115 depot/ $115 on-site
Total Tec Systems (201) 906-6500	Microvax II and III, PDP-11, Vaxstations	No	Northeast U.S.	8:30-5	12	100	Both	3 dispatch/ 1 depot	1-10 days	4 hours	Yes	Yes	Both	Yes	Yes	Hospital, university, nonprofit	$75 depot/ $120 on-site
TRW Customer Division (800) 255-3029	PDP-11, VAX-11/700 series, VAX 8000 series, Microvax	Yes	U.S.	24 hours/ 7 days	40-50	NP	Both	200 service locations/ 1 depot	10 days	2-4 hours	Yes	No	Both	Yes	Yes	Volume	Depot by quote/$145 on-site
2M Corp. (201) 328-6666	LA series, VT series	No	N.J., southern Conn., eastern Pa., N.Y., Long Island	8:30-5	8	350-400	Both	4 dispatch/ 1 depot	3-5 days	Same day or next day	Yes	Yes	Neither	Yes	No	Volume, bid system	$65 depot/ $90 on-site
U.S. Computer Group, Inc. (516) 783-6144	PDP-11 series, VAX-11/700 series, Microvax 2000 and 3000 series	No	Northeast U.S.	24 hours/ 7 days	15	400	Both	4 dispatch/ 4 depot	2 days	4 hours	Yes	Yes	Consulting	Yes	Yes	5% discount for annual payment	$85 depot/ $110 on-site
Unisys Corp. (215) 542-4011	PDP-11, Microvax II, VAX-11/700 series	No	U.S.	24 hours/ 7 days	NP	NP	Both	80 dispatch/ 16 depot	1 day	None	Yes	No	Neither	Yes	No	NP	NP
Unitronix Corp. (201) 981-1600 x355	Terminals, Microvax II, Vaxmate, VAX 3300 and 3400, PDP-11 series, all DEC printers	NP	N.J., parts of N.Y., Conn., Pa.	8-6	10	65	Both	1 dispatch/ 1 depot	5 days	4 hours	No	Yes	Both	Yes	Yes	NP	$70 depot/ $90 on-site

Information refineries

Electronically distilling business' raw material to make it more usable



TOMMI HITTO

BY JOHN H. CLIPPINGER and BENN R. KONSYNSKI

Whether in publishing, manufacturing, marketing, finance or general management, the strategic importance of effective and efficient information management is on the rise.

Consider, for example, a major publishing house — formerly organized by individual media products — that is now developing a platform for collecting information that will facilitate sharing of all publishable material through a variety of media.

Clippinger is president of Starr King Communications, Inc., a text-processing and artificial intelligence consultancy in Cambridge, Mass. Konsynski is a visiting professor at Harvard University's Graduate School of Business Administration.

Or take the electronics manufacturer that is developing artificial intelligence-based tools to electronically gauge its competitive positioning by scanning clippings and other information based on content, not text, patterns.

These and other activities present clear evidence that companies are trying to leverage information technologies for radical internal restructuring and competitive positioning. Furthermore, new management pressures suggest that the critical role of such technologies in day-to-day, hour-by-hour managerial decision making will accelerate.

Accentuating that "business as usual" is no longer feasible are the following modern business realities:

- The compressed time-to-market phase required for successful products and services.
- The movement toward regional, segmented marketing strategies.
- The increasing incidence of competitive initiatives.
- The impact of new partnering arrangements — often with traditional competitors.
- Downsizing, destratification initiatives and structural changes occurring inside many of today's organizations.

How can IS help today's managers cope with the extraordinary pressure to deal with more information in a shorter time and increase the quality of the decisions? Fortunately for those in this environment, extraordinary information opportunities exist today that were unavailable just a few years ago.

The solution lies in taking advantage of these opportunities through new techniques in both the organizational and IS aspects of the enterprise. One such initiative — the concept of information refineries — may serve to address certain of these pressures.

To understand the concept of information refineries, consider that one of the early triumphs of information systems was simply to put a small portion of corporate information into electronic form. Success was often measured in terms of how much electronic information could be produced.

That, however, was a long time ago; today, less is more. Users' time and attention, not information, are in short supply. As organizations become flattened, networked and electronically integrated, the specter of information overload and gridlock threatens to undermine the expected benefits and savings (see story page 76).

A game of catch-up

Unless IS executives begin planning now on how to reduce their information overload problems, they will forever be playing catch-up — one step behind the next technology wave — with demand outstripping capacity. Our information systems will be similar to Third World telephone systems, in which the addition of each new phone creates an exponential increase in demand for capacity.

The IS executive, however, has an obvious advantage that the Third World telecommunications planner does not. New distribution technologies are not only reducing the costs of adding new bandwidth, but new software technologies can help eliminate unnecessarily heavy traffic and unwanted communications and documents.

Just as data compression techniques can account for highly noticeable improvements in channel efficiencies, so can information-refining techniques

• Because today, less is more

• Producing databases, video and graphics

• Avoid being gridlocked by your own success

dramatically reduce the volume of unwanted and unnecessary information.

A refinery is defined by the dictionary as a device for "removing impurities from a crude or impure material"; in the case of oil or sugar, it is defined as a "fractional distillation usually followed by other processing (cracking in the case of oil and crystallization in the case of sugar)."

Information refining is an electronic, computer-based process that takes undifferentiated volumes of raw information — magazines, newspapers, reports, memos, newsletters, directories and databases — converts them into electronic form, extracts the content units and recombines them into a new form that can be distributed in a variety of ways. The end product of information refining can be sold as a commodity, as a finished good or as an input for another refinery.

Just as a petroleum refinery takes crude oil and refines it into gasoline, motor oil, heating oil or aviation fuel and introduces it into various petrochemical processes, the finished product of an information refinery can take many forms: a database, a business letter, marketing report, electronic publication, directory, paper publication, voice message, graphic or even video animation. The salient point about an information refinery is that it not only separates out the impurities of raw information, but it breaks down the material into a basic form so that it can be further processed and recombined into new types of end products.

Most of the electronic information that today's professional consumes is still in its raw state. Often, it contains only a portion of the information that the user wants, and either he has to search through a series of documents or reports to find what he wants or he has to query a variety of hard-to-access databases. The information is seldom organized in a fashion that is comprehensive and coherent.

In many such cases, the cost — in terms of time, effort and intellectual overhead — of acquiring the right information exceeds the usefulness of the information.

As the volume and velocity of corporate information continues its exponential growth, it will simply be impractical for users to cull useful data from useless information. Unless there are technological aids and intelligence amplifiers to assist the user, the information organization could become gridlocked by its own success.

As information overload and gridlock problems become more pronounced and visibly impede the effectiveness of organizations, information refineries — actually a new application genre that will provide products within the next year or so — will emerge to help IS cope.

Initially, this technology will be regarded as a "countertechnology," invented to correct the excesses or imbalances of other technologies, but eventually, it will become a strategically important product and applications category in its own right.

First-generation refineries

We are just now beginning to see the first generation of information refineries. They are primitive, early examples in that their refinery function is limited to working with the literal terms of words, keywords and synonym lists. They can be used to filter out many unwanted terms, but the filter is still quite coarse and thus admits many impure terms. These types of refineries, which rely on word indexes (inverted files) and the searching and indexing techniques of keyword bases, suffer from poor recall performance (when you do not get all the documents you should) as well as poor precision performance (when you get more documents than you should).

INITIALLY, THE INFORMATION REFINERY will be regarded as a "countertechnology," invented to correct the excesses or imbalances of other technologies, but eventually, it will become a strategically important product and applications category in its own right.

Also, these early refineries are incapable of breaking the information down into a common form, in which the basic units of the information can be recombined into many refined, high-value-added information services or products organized to address the specific needs of a user.

Although first-generation refineries are undoubtedly useful, they can create unrealistic expectations and hence major disappointments. For many impatient users, they are simply too crude and cumbersome to be very useful. For example, a new compact-disk/read-only memory-based computer library contains more than 50,000 computer-industry articles on one disk. However, when you try to search for topics of interest, you quickly realize that you are still in a hit-or-miss world. It cannot recognize names, and it is thrown off by the simplest of the morphological variants, plurals.

A query on mergers and acquisitions returns more than 1,000 articles, hardly the level of reduction required to get at articles of interest. Likewise, simple morphological changes can result in significant differences in retrievals.

Keyword-based retrieval systems such as this one rely on co-occurrence as a

A few suggestions for
with another international

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substitute for semantic relationships. However, the simple co-occurrence of a word with another word does not mean that they are semantically related. For instance, "John Smith never worked for Acme" would be returned by a proximity-keyword query trying to find out who worked for Acme.

Even the high-speed, dedicated string-searching engines — such as those found in The Connection Machine from Thinking Machines Corp. and Gescan International, Inc.'s text-retrieval system — suffer from the same types of limitations because they are incapable of recognizing linguistic categories.

Today's examples of this type of first-generation refineries are found on electronic mail filters or filters that mark and route messages and news wires. Other examples are the standard Boolean-based text-retrieval systems.

Second-generation refineries

To move beyond simple keyword filtering-type refineries requires another level of analysis and categorization — typically a mixture of grammatical and semantic categories. In the simplest sense, such systems depend on word categories, word morphological analysis (prefix and suffix cropping), word-sense disambiguation, simple syntactic categories (prepositions, proper nouns, modifiers, modals and so on) and some form of contextual information on the relative position of words.

Approaches to text classification or extraction often mix statistical techniques and some elementary form of semantic and/or grammatical analysis. One interesting example of this type of refinery is a system that was developed during the last few years by AT&T Bell Laboratories for locating experts within the firm. By using the documents of different technical divisions as input, this refinery fits the departments and the terms they use in a 100-dimension space. This system is used to help researchers locate others who are doing or have done related work. This application has enormous potential in helping firms make more effective use of their information assets.

With this simple, next level of abstraction, it is now practical to build applications that are tailored to look for certain predetermined patterns in the text. Such systems can recognize the equivalence of a variety of ways of stating the same idea but have limited ability for extension. In short, they are highly application- and source-specific.

Nonetheless, their recall and precision performance tend to be much higher than the first-generation refineries, and they can serve many useful automated indexing and filtering functions. Because such systems have limited and often ad hoc linguistic and semantic models, however, they cannot function as refineries except in a limited sense. Even in those cases, they can be used only to convert from one format to another when both formats are highly constrained and scrupulously observed. These refineries often run on a dedicated processor as a server on a local-area network.

Third-generation refineries

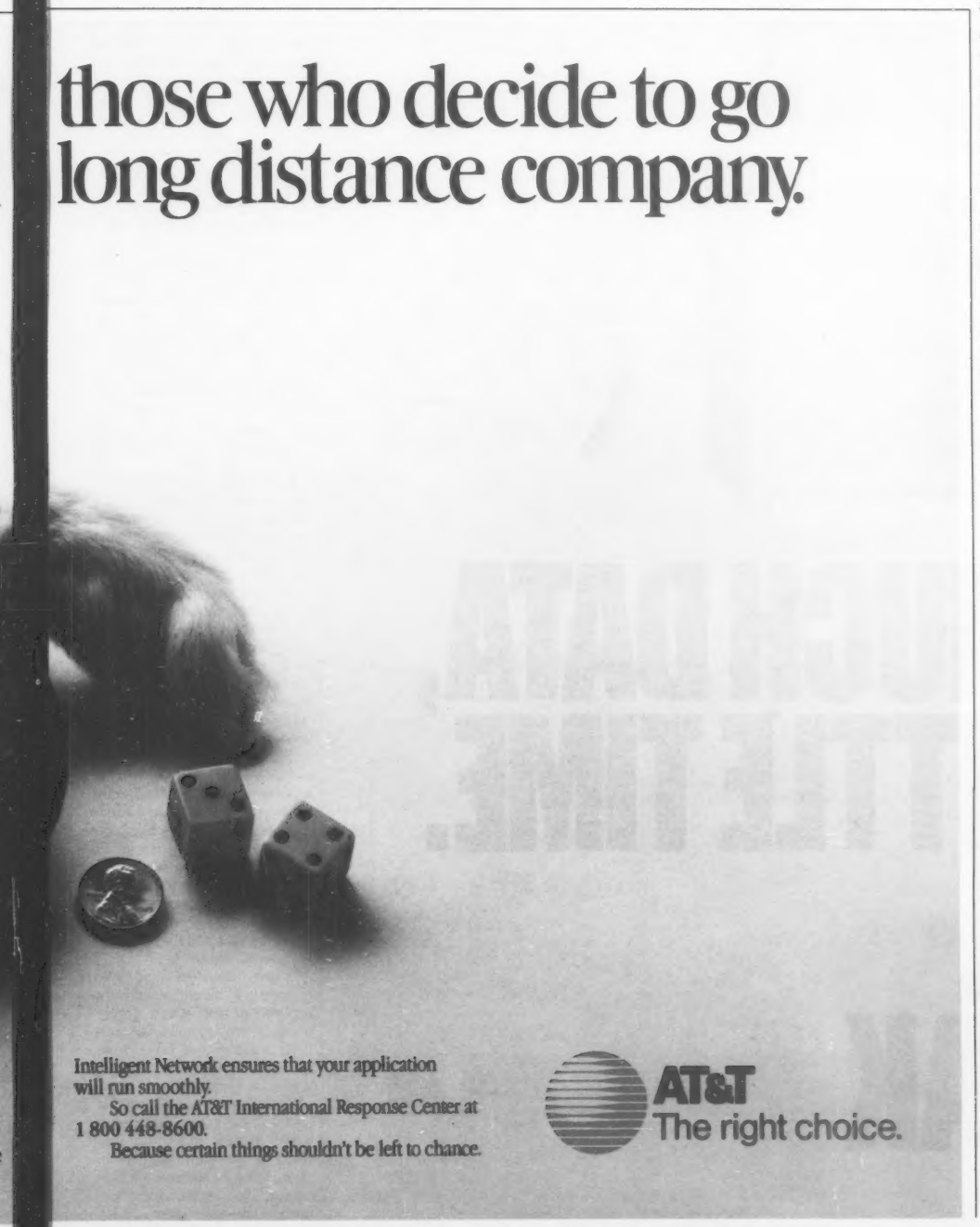
To meet the complete definition of a refinery requires not only the elimination of impurities from the crude information but the breaking down of that information into a form that it can be processed by successive refining methods. A complete information refinery should be able to take information from diverse sources in diverse formats covering diverse topics, strip out all their impurities and transform them into a basic form that can then be reprocessed, refined and transformed into a variety of specialty products and services. Such applications include the population of databases from free text sources, the concrete representation of object models, the generation of composite publications and a variety of alerting and intelligent agent applications.

Although hardware platforms can now support sophisticated, high-throughput natural-language processing, fully automated refineries of this type are still experimental and are used primarily for well-specified defense and intelligence applications. Furthermore, it is unlikely that there will be general-purpose refineries of this type for a long time because even the most advanced natural language processing systems of today have only shallow and fixed methods for interpreting texts.

Because the rules and terms for many forms of human communication, even in written form, are often changing and depend on unstated but implied shared experiences and ways of seeing things, it is unlikely that personal, highly narrative and idiosyncratic communications will lend themselves to the fully automated refinery. However, technology often has a way of surprising us.

As organizations move to fully electronic operational and business environments, a premium will be placed on the selective acquisition and distribution of information. Increasingly, information will not be treated as an overhead item but valued as an input into the work process and refined and recombined to complete a variety of tasks.

In this electronic business environment, it is only natural — and inevitable — that information refineries will evolve to automate the acquisition and distillation of information from a variety of external and internal sources. It is important that IS professionals anticipate the inevitable exponential growth in the volume of corporate information. They can do so by realistically planning for the gradual introduction of refineries as shared and focused platforms for information acquisition, selection, preparation and distribution. •



Culprits of information overload and gridlock

As organizations become more information-based and information from internal and external sources becomes available on demand, traditional corporate functions such as planning, marketing, technical support, documentation and publishing will be dramatically transformed or even eliminated.

Although it is clear that these trends will increase the importance and visibility of the information systems professional, they could do so in a less than desirable way, creating almost unmanageable crises.

Today's enabling technologies and business trends, while allowing a new level of organizational flexibility and functionality, also have the capability of exacerbating information overload and gridlock problems. In effect, they could become victims of their own success, adding to the need for information refinery-type applications.

Some of these enabling — and possible ultimately disabling — trends include the following:

• **High-capacity and high-reliability optical scanning and character recognition.** What is not in electronic form now can be in the near future. New multipurpose copiers/scanners/facsimile machines will act as high-capacity data-capture and conversion devices.

Today, there are inexpensive multifont and multicolumn optical character recognition machines that achieve impressive and practical levels of performance.

• **Availability of external and internal information in electronic form.** Most major newspaper and magazine publishers now make their publications available in electronic form. Furthermore, desktop and electronic publishing, groupware, electronic mail, local-area networks and word processors are accelerating the trend toward the availability of internal information in electronic form.

• **Document format standards and automated recognition.** With the support of virtually all computer vendors and the aggressive endorsement of the U.S. Department of Defense, an International Standards Organization standard for the markup of technical documents — the Standard Generic Markup Language — has been adopted. Products that automatically scan technical documents and insert the appropriate markup terms have been developed.

These two developments will vastly improve the speed and efficiency of technical documentation preparation and facilitate the automated classification and retrieval of complex technical and legal documents.

• **Hypertext and hypermedia.** Apple Computer, Inc., through its Hypercard product, has been a major force in showing how new types of nonlinear documents and publications can be simply created through the integration of graphic, textual, video and sound media.

Hypertext products link parts of different documents according to their content. They can be extremely effective educational tools and are one of the first products to exploit the malleability and shareability of text in its electronic form.

• **Software integrated circuits and knowledge codification.** Advances in object-oriented programming make it possible to encapsulate knowledge and software functions in independent modules that can be "plugged in" and combined with other modules as if they were integrated circuits.

These techniques could make it feasible to assemble software applications from standard components. Simple knowledge codification techniques taken from the expert systems world make it possible to capture and distribute certain forms of routine knowledge as a corporate asset.

• **Automated indexing and routing techniques.** Intelligence agencies and vendors of financial information have developed and will soon deploy

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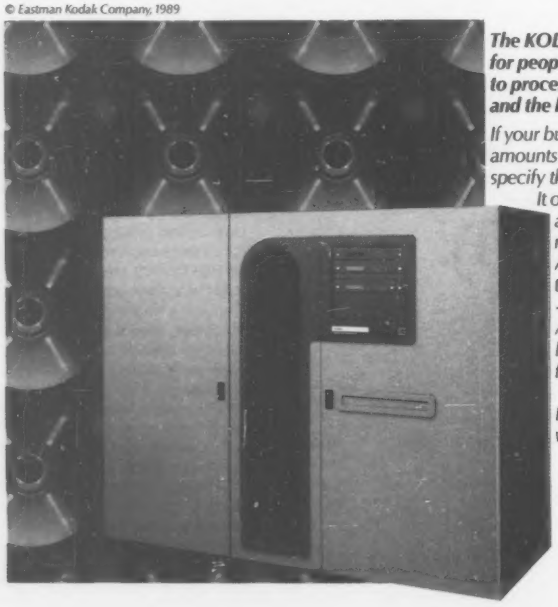

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artificial intelligence-based systems for the indexing and routing of real-time textual information.

• **Inexpensive and high-capacity distribution channels.** Methods for distributing information products and services are proliferating in the form of high-capacity private corporate networks, inexpensive one- and two-way satellite dishes, fiber optics, 500M-byte compact disk/read-only memory, 300M-byte erasable and writable 3½-in. optical disks, removable 100M-byte Winchester disks, audiotext, FM broadcast and 9.6K bit/sec. telephone lines.

For example, a Dow Jones & Co., through its Dow Vision service, is offering direct 56K-bit links to corporations for the bulk downloading of business information.

• **Bulk pricing of corporate information purchases.** Information vendors are beginning to recognize that usage-sensitive pricing and onerous royalty agreements are inhibiting demand for their services and preventing the resale and republishing of their products. Customers are demanding the right to reuse and combine external sources within internal sources. Expect to see the same open-architecture mindset now prevalent in the workstation industry to spread to the information industry.

• **On-line and distributed management.** The advent of networked organizations, groupware and other ways of coordinating and directing work in globally distributed organizations will not only increase the volume and velocity of information within an organization but will require new business techniques for managing on-line and distributed data.

• **Electronic data interchange.** Intraorganizational systems for integrating many of the marketing, logistic and distribution functions of buyers, sellers, manufacturers and suppliers are growing at an enormous rate.

They, in turn, are creating enormous volumes of data and information that have transactional, managerial and analytic value. Not only can companies more effectively tie into their suppliers, but they can use data from their operations to monitor and improve their performance and relationships.

• **High-performance platforms.** Gordon Bell, a former Digital Equipment Corp. engineer and respected pioneer in computer architectures, estimates that the price/performance ratio of processors is increasing at a rate of 70% annually.

Reduced instruction set computing architectures and multiprocessing techniques promise to deliver 100 million instructions per second (MIPS) to the desktop within the next two to three years, with high I/O capacity servers achieving performance levels in the range of 500 to 1,000 MIPS.

With this type of processing power available on the user's premises, more and more value-added processing will be performed by the customer.

Before you go off implementing any or all of these technologies, remember that they can also be the culprits of information overload.

Today's information systems manager must, therefore, give proper attention to careful and incremental monitoring, selection and implementation of the technologies. The information-refining applications on the horizon will provide one way of dealing with them.

JOHN H. CLIPPINGER and
BENN R. KONSYNSKI

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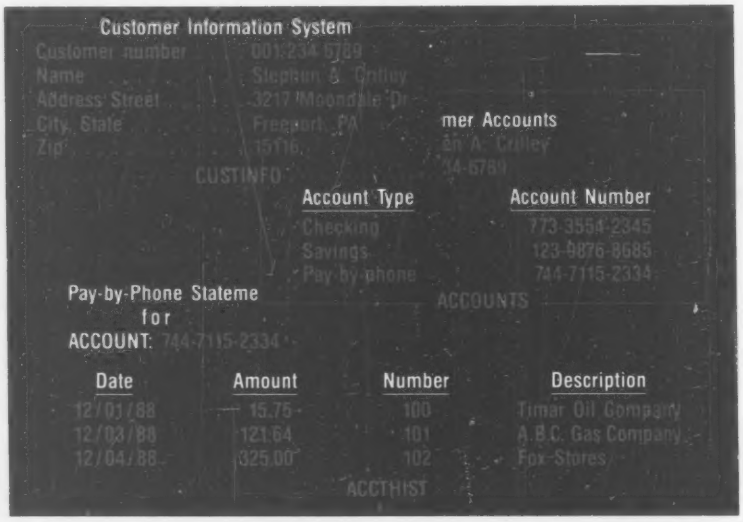

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INDUSTRY INSIGHT

Charles Varga

Trail's end

McDonnell Douglas' decision to sell off its data communications business to British Telecommunications PLC for $355 million represents the beginning of the end of the dreams and aspirations of the company's people — some of the true pioneers in our industry. But as the saying goes, it's the pioneers who take the first arrows.

In a letter to employees, Chairman James F. McDonnell said, "This cutback is a disappointment to me, since it represents an abandonment" of McDonnell's "original goal to be a leading supplier of broad-based information systems."

Since 1983, McDonnell Douglas Information Systems Group has ranked among the top 10 companies in its field. From humble beginnings in a single building next to the runway at Lampert Field in St. Louis, the company grew to

Continued on page 81

Solbourne steers clear of 'clone zone'

BY JAMES DALY
CW STAFF

LONGMONT, Colo. — Like the mule-toted miners who roamed here more than a century ago, Doug MacGregor arrived at the base of this sawtooth stretch of the Rocky Mountains looking for gold.

But unlike the prospectors of old, who panned icy mountain creeks looking for riches, MacGregor knows exactly where his treasure is located. As chief executive officer of Solbourne Computer, Inc., MacGregor is never more than a few steps from the star to which he has hitched his wagon — the Series 4 workstation.

The Series 4 resides in the shadow of a pinnacle of the computer industry, Sun Microsystems, Inc. MacGregor and company are producers of the world's only Scalable Processor Architecture (Sparc)-based Sun-compatible workstation.

Although the company's status is something it is intensely proud of, it is also a source of semantic quicksand known as the "clone zone." "The word 'clone' implies cheapness and often leaves a bad taste in people's mouths," MacGregor said. "We're not a cheap clone. We put a lot of innovative engineering into these machines."

A quick glance at the Series 4 reveals a lot more than mindless copycat work, MacGregor pointed out. For one thing, Solbourne is also unique in the workstation market because it offers multiprocessor workstations. In addition, the company has developed a high-performance bus, called the K-bus, that operates at 128M byte/sec. — fast enough for at least four processors. The starting price is $23,200 for a machine capable of processing 9.5 million instructions per second (MIPS).

Customers, too, have noticed the difference. "We're a strong believer in Sun's Sparc philosophy, so we needed no convincing on that end," said Phil Cohen, director of research computing at the Research Institute of the Scripps Clinic in La Jolla, Calif., who purchased four Series 4/600s. "But when we analyzed the price/performance of the Solbourne and realized we'd have to buy eight Sun machines for what we got with two Solbourne machines, it was pretty hard to pass it up."

Solbourne also provides users with something more. "We like to hook them with the extras," MacGregor said. Customers have said that dealing with the company is like stepping back 10 years and finding a gas station that not only fills your tank but also wipes the windows and checks the oil.

The result has been an incendiary year for Solbourne. Since December, when it made its official market debut, the company has introduced workstation configurations capable of providing 30 MIPS, opened up a European operation and signed on five international distributors in territories ranging from Australia to Israel. Along the way, it has grown from 80 employees to 225 and moved to a brand-new, mahogany-bedecked 60,000-square-foot office building.

Privately held Solbourne stands on its prerogative to keep sales figures undisclosed. However, according to a company spokesperson, "several hundred systems" have been sold since the December debut.

Although the company's success stems from its association with Sun, MacGregor contended that was a happy accident. While completing a doctorate in computer science in Japan in 1986, he decided to build a line of systems around a powerful new microprocessor that he would design. As a principal designer of the Motorola, Inc. 68020 microprocessor, it certainly did not seem beyond his ability.

MacGregor then traded a $38.9 million round of start-up funding from Matsushita Electric Industrial Co. Ltd. for a 52% share in his foundling company.

But a funny thing happened on the road to his silicon dream: He discovered the Sparc chip. "We got lucky in terms of timing," MacGregor said. "We real-

Continued on page 81

Up & Coming: *Solbourne Computer*

Chairman: Douglas MacGregor
Number of employees: 225
Headquarters: Longmont, Colo.
Product description: World's only Sun-compatible workstation
Representative quote: "The word 'clone' implies cheapness and often leaves a bad taste in people's mouths. We're not a cheap clone. We put a lot of innovative engineering into these machines."

MCC lowers financial barriers to research

BY NELL MARGOLIS
CW STAFF

AUSTIN, Texas — How about a leveraged buy-*in*?

That is what companies looking for advanced technological research, but lacking billion-dollar bottom lines to fund it, will now find available under new rules adopted last week by pioneer U.S. private research consortium Microelectronics and Computer Technology Corp. (MCC), according to an MCC executive.

One of the heavy hits leveled at consortiums, said MCC director Stephen Maysonave, is that only giants need apply. Take MCC: Originally conceived in 1982 as the nation's hedge against Japan's ambitious, government-sponsored Fifth Generation project, "the idea was, bluntly, let's band together for strength if we must — but let's keep the club small," Maysonave said. With a $250,000 fee to gain the shareholder status necessary for participation in the group, plus "several million dollars per year [in required lab funding] with a multiple-year commitment," he said, elitism was an implicit charter article.

No more, Maysonave said. As of last week, a newly defined class of MCC participants called "associate members" can buy into the research efforts of any of the 10 projects that make up MCC's Advanced Computing Technology (ACT) program for a $25,000 gate fee, plus annual project support costs ranging from $125,000 to $650,000.

"The name of the game is leverage," Maysonave said. For example, he said, a company might pay $350,000 a year to share in ACT's neural networks project, "but that company would be getting some 12 person-years' worth of high-level research for its investment." Research areas open for associate member participation include artificial intelligence, human interface, database, data conversion, optics in computing, deductive computing, parallel systems prototyping, neural networks and object-oriented and distributed systems.

Like other exclusive clubs that have made such moves in recent years, MCC is lowering its entry barrier to lengthen its life expectancy by broadening its appeal — and, not incidentally, spreading its overhead. Approximately $100 million has flowed into the consortium from its six charter members to date, without commensurate commercialization. Brought on board at MCC to help the consortium position itself for business in the 1990s, 21-year computer industry veteran Maysonave found that the game plan virtually wrote itself. Unbundling ACT's research portfolio, he said, was a natural move.

Micronics quells burglars

Armed gang foiled by quick-witted employees

BY JAMES DALY
CW STAFF

SUNNYVALE, Calif. — There were no shouts of "Your semiconductors or your life," but the late shift at chip-maker Micronics Computer, Inc. got a good scare earlier this month when gunmen burst into their office, fired shots and threatened employees before disappearing empty-handed into the night.

Police theorize that the gang may have wanted to steal computer components to sell on the black market, but the plan was thwarted by a swift-footed employee who phoned police after he slipped away from the intruders and locked himself in a room.

The incident began Aug. 15 shortly before 11 p.m. when four assailants clothed in T-shirts, jeans and ski masks entered the office waving their handguns and ordered the seven employees to the floor.

One worker immediately raced into another room, locked the door and dialed the police. The gunmen fired twice at the door handle in an attempt to shoot the lock off but to no avail, a company spokesman said. At least one other employee also fled and phoned the police. By the time police arrived with a 15-member special weapons and tactics team, the robbers had fled. No one was injured during the course of the incident.

Comdisco tosses hat in consulting ring

BY ELLIS BOOKER
CW STAFF

CHICAGO — While Price Waterhouse and Arthur Andersen & Co. iron out the details of their merger expected to close next month, another Chicago-based company has just entered the information systems consulting business.

Earlier this month, Comdisco Data Services, Inc. announced the formation of a new business unit offering contingency planning, information systems and communications systems consulting. Comdisco Consulting Services will take over the consulting work formerly handled by the Contingency Services Division of Comdisco Disaster Recovery Services, Inc.

Meanwhile, investors continue to be attracted by the systems consulting and integration business. Earlier this month, TA Associates, a Boston-based venture capital firm, made a $5.8 million investment in TSC, a Chicago consultancy formed last May by former members of Arthur Young's Midwest region consulting practice.

Explaining the investment, TA officials noted that the systems integration and consulting business generated $6 billion in domestic sales last year and is growing at a rate of 15% to 20% annually.

With revenue of $15 million in its first year of operation, TSC expects revenue of $45 million and the addition of nearly 100 people to its staff of 220 by the end of its fiscal year next May.

The firm, which has targeted consumer products, financial services, insurance, manufacturing and a list of cross-industry technologies such as imaging and intelligent workstations, currently serves 18 major clients out of offices in Chicago, Washington, D.C., New York and Dallas.

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IN BRIEF

G'dye, podner

What with the wide open spaces and ranchers, parts of Australia *do* look like Texas, which should make **BMC Software, Inc.** comfortable in its new Melbourne office. The Sugarland, Texas-based firm, which makes enhancement products for IBM mainframe software systems, hopes to sell to the 1,100 IBM mainframes it believes are in Australia and New Zealand. BMC posted revenue of $63.3 million for the fiscal year ended March 31, and the company said that international sales from its six foreign offices were 39% of this figure.

Sungard addition

Sungard Data Systems, Inc. has agreed to merge with fellow investment management systems provider **Dyatron Corp.** Once the union is completed in the fourth quarter, Dyatron will be a Sungard subsidiary, and Dyatron stockholders will receive about 22% of Sungard's outstanding stock.

Try eloping

Graphics systems vendor **Adage, Inc.** has resumed merger negotiations with **General Business Investment Corp.** after reporting last week that earlier union plans had petered out. It's a slimmer company looking for a mate: Adage last week laid off approximately 40 employees.

Network scoop

Systems Center, Inc. (nee VM Software, Inc.) has acquired from a European developer a network administration product for IBM Systems Network Architecture and X.25 networks. The company shelled out more than $1 million for Net Insight, which among other functions provides usage and status reporting and fault isolation.

Ascending Pyramid

Twenty-six-year **IBM** product development veteran Lance Johnson has assumed the newly created position of vice-president of hardware development at **Pyramid Technology Corp.** Johnson's most recent position at IBM was program manager of a parallel attached processor product.

Lessors link

Computer-leasing firm **Computer Sales International, Inc.** (CSI) has purchased virtually all of the computer equipment assets of **National Computer Equipment Corp.** The move gives CSI an annual revenue of more than $150 million.

Varga

CONTINUED FROM PAGE 79

$1.3 billion in annual sales last year but accumulated losses over the past five years of $340 million.

McDonnell noted that the IS group and the aircraft manufacturing firm had not become "interactive and synergistic." Despite a small second-quarter profit, he said, the IS group was unable "to implement several strategic requirements." They did not attract "a major voice communications partner" and had not developed a product that could "powerfully differentiate us from our competition."

I can tell you from experience what McDonnell Douglas Information Systems did have. Even in the '60s and early '70s, the company had the finest integrated engineering and manufacturing control systems, including what had to be the most advanced computer-aided design, engineering and modeling system available; it is still state-of-the-art today. The F-4 Phantom, one of McDonnell Douglas' highly successful military aircraft, was designed, engineered, simulated and built without a working prototype — an uncommon feat.

In his statement to employees, McDonnell noted "increased commitment" to this business segment. So why its demise? First, large companies tend to value their fledgling IS and processing subsidiaries in terms of revenue, as a multiple of a number of DC-10s, 737s or barrels of oil sold in a year. IS company and aircraft company personnel were "interactive and synergistic," but only to the point that their cultural differences and management styles would allow. Neither insiders nor outsiders could pass through an invisible wall. With most major voice communications firms trying to slit each others' throats through price wars, product gouging and employee pirating, it's no wonder that McDonnell Douglas' data communications business could not find a major partner.

Still, how can a firm with the image, professionalism and financial resources of McDonnell Douglas not succeed? Maybe the answer is deeper than professional management, financial strength and the image of the parent. Many other players have exited from the IS business. Translating an understanding of our industry into the maintenance of a consistent and increasing profit performance seems to be an elusive goal.

One thing is clear. In my experience in this industry, earth resources people and product manufacturing people have a hard time understanding and communicating with intellectual and knowledge-based industry people. They act, think and speak differently, and they generate revenues and earn profits on a very different basis. Whether one is equating numbers of airplanes to data processing revenues or barrels of oil to equivalent installed base, the answer is still the same: Skills, knowledge and understanding in materials and manufacturing may not apply to information processing. To McDonnell Douglas' IS people: You gave it a good try. Toodleoo, cheerio, careful how you go and God Save the Queen.

Varga, a 20-year computer industry veteran based in Frenchtown, N.J., is publisher of "The Cerberus Report," a study of industry mergers and acquisitions.

Solbourne

CONTINUED FROM PAGE 79

ized that hardware companies don't want to swim upstream forever, so we were looking to build a power chip that could support a large base of application software. Sparc already had that."

But while Sun boasts that there are more than 700 Sparc-compatible applications, Solbourne's figure is closer to 300. Why the discrepancy? "Our definition of compatibility is very conservative," MacGregor said. "We don't just blindly put Sparc applications in our catalog. We experiment with them to see if they do what they say they do. We've already found two applications that were not compatible at all. The software, after all, is what differentiates a productive tool from a hunk of iron."

Although the machines are based on the Fujitsu Ltd. 32-bit Sparc chip and manufactured overseas by Matsushita, MacGregor settled Solbourne in the flatlands of Colorado not only for what it was, but for what it was not.

The only place to be

"I refuse to live in the Silicon Valley or be located outside of Boston," he said. So he came to this town 30 miles north of Denver, where rents are low, the air is clean and home is a seven-minute drive that may be delayed only if you get behind slow-moving farm equipment.

MacGregor says he is not content to let Solbourne tread water. The Series 5 machine, which will be introduced later this year, will incorporate a powerful Sparc chip from Cypress Semiconductor Corp. that is expected to double system performance.

Solbourne is also creating a 64-bit ultra large-scale integration (ULSI) chip, which is scheduled for unveiling later this year on its Series 6 products. The ULSI design contains a Sparc integer CPU, floating-point processor, memory management unit and instruction and data caches on a single chip.

"Our goal for 1990 is to provide 30 MIPS or more for less than $10,000," MacGregor said.

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Lee Levitt, Senior Analyst, Distribution Channels, IDC *(San Francisco only)*

Networking in the '90s: Consumption and Competition
Mark Leary, Director, Communications Research, IDC *(Washington and New York only)*

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TI drug test policy draws fire

Group lobbies city against plan, cites privacy, 'false positives'

BY PATRICIA KEEFE
CW STAFF

AUSTIN, Texas — Plans by Texas Instruments, Inc. to implement a company-wide, top-down random drug-testing program next month have spurred a small group of employees to lobby city fathers to ban this type of testing. If they are successful, Austin will join two other cities — San Francisco and Berkeley, Calif. — and six states that specifically prohibit this activity.

Objections to random testing typically center around privacy issues and the potential for "false positives," or tests that indicate the presence of a banned substance when in fact it is not there.

On-site drug use and sales have been documented at many companies. Many U.S. companies routinely test new hires for drug use. The next step commonly taken involves mandated testing for classified and security personnel or for those workers — railroad engineers or pilots, for example — who hold the fates of others in the balance every time they perform their jobs. As the so-called war on drugs escalates in this country, many U.S. corporations are quietly looking into a third phase — random drug testing.

Members of the group protesting TI's policy, Citizens Advocating Protection of Privacy (CAPP), stress they are not opposed to drug testing for workers in security or sensitive posts or for individuals for whom there is "probable cause" — a reasonable indication that drug use or activity is taking place.

The group's position is that random testing, regardless of how it is done, is "un-American and contradicts principles embodied in the Constitution," said CAPP spokesman Alan Wexelblat, a former TI software engineer who quit his job in protest of the new drug policy.

CAPP is betting on what Wexelblat called a deeply rooted inclination among Texans to defend privacy. TI in turn claims the protesters are a very small minority of its work force. Fewer than 1% of TI's 50,000 employees, according to a company spokesperson, have called a hot line to comment on the testing, and only 10% to 15% of those have taken issue with the policy.

CAPP has about 35 dues-paying members from TI and other local companies, including Motorola Corp. There are plans to launch a Massachusetts chapter once Wexelblat relocates to the Bay State. The group said the issue, and eventually its efforts, belong on a national scale.

TI also has supporters for its program, which is believed in some quarters to be leading edge. It involves two-phased testing — including use of gas chromatography/mass spectrometry — and includes counseling, rehabilitation and education programs.

The company decided to implement the program mainly to comply with Department of Defense and other federal agency regulations mandating a drug-free workplace for government contractors. In a prepared statement, Chairman, President and Chief Executive Officer Jerry R. Junkins said, "Drug and substance abuse is a major concern not only for the company, but also for our families, our city and our country."

TI believes that with the help of internal focus groups consisting of about 100 workers from the assembly line up to the executive office, it has been able to draft a fair, reasonable and safe program. As TI implements the program, slated to kick off next month with initial testing at the executive level, interested area firms will be watching closely.

Weekend activity under scrutiny?

CAPP raises several issues, not the least important of which is whether any employer has the right to monitor off-work activity. Drugs — legal and illegal — can stay in the body for a day or more. A test could pick up drug use from weekend activities.

TI's response to this issue is simply to note that the test just detects the presence of drugs and does not determine when they are used.

The company flatly dismissed charges that it might use the tests to identify pregnant employees or those with illnesses that workers would rather keep secret, such as AIDS or other sexually transmitted diseases. "We are only testing for nine substances," a TI spokeswoman said. Among them are cocaine and crack, cannabis, amphetamines and barbiturates.

Incorrect test results are another concern. Chuck Nielson, TI's vice-president of personnel, dismissed widespread reports in the media that commercial drug-testing laboratories in the U.S. are plagued by errors, which result in part from poorly trained workers and a pay-by-piece system.

"Those folks printing that just don't understand," he said, adding that if the tests are done correctly, there are no errors. TI claims the firm it hired to process the exams is used by the military and has a virtually error-free record.

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Recasting big steel's image

Mills offer rewards for IS professionals willing to get their hands dirty

BY JANET MASON
SPECIAL TO CW

Stiff competition from foreign firms during the past 10 years has led to an intensive pace of automation at U.S. steel mills. Although the economic situation has constrained the hiring of information systems employees, it has also brought high visibility to the efforts of those on board.

"Plant people are realizing that the only way to improve productivity is through automation," says Norb Connors, controller of information technology for USX Corp.'s U.S. Steel division in Pittsburgh.

Twenty years ago, IS people were designing, implementing and maintaining process control systems in the mills, but plant operations people did not always devote a lot of attention to the work, Connors says.

With competitive pressure becoming more intense, USX moved its IS people from headquarters to the mills and involved plant operators more directly in the development of mill systems.

At the height of its downsizing efforts in 1981, Bethlehem Steel Corp. in Bethlehem, Pa., also zeroed in on computerization, according to George Fugere, vice-president of operations services for the company. The IS department grew from 700 to 1,200 full-time employees and from 100 to 600 outside contractors at the same time that total employment fell from 140,000 to 39,000 workers.

Giant cuts back

After Bethlehem Steel shed unproductive mills and completed major automation projects, IS was scaled back to its current size of 550 full-time workers. The company now uses between 150 and 200 outside contractors. When it needs additional IS people, it tends to use contractors rather than add full-time staff, Fugere says.

As a result of the downsizing and automation projects, Bethlehem Steel has been able to make money in the last two years. Last year it earned $403 million — more than double the previous year's income — on revenues of $5.5 billion.

However, Fugere expects no increase in IS employment; corporate growth is likely to come through acquisition of nonsteel businesses, which might have their own IS operations, he says.

"In the future, you won't be able to base a company solely on steel," Fugere says. "The demand is decreasing. There are too many substitutes and too much foreign competition."

Leslie Finkel, manager of the Pittsburgh office of IS recruiter Source EDP, Inc., confirms the picture of soft hiring in the steel industry, with the emphasis on contractors as companies seek to avoid layoffs.

> "THERE ARE few areas where you can see the result of computer systems so directly. You write the programs and then actually see how the process control system moves the equipment, how it starts motors."
>
> NORMAN J. PETTERSON
> CONSULTANT

Contractors tend to focus on technical specialties, so that they can tackle a job immediately. In the short run, this approach works well for both the mills and the contractors, who are usually paid well.

However, the contractors usually have difficulty developing management skills over the long run, Finkel says.

Like other manufacturing technologies, mill automation systems often run on Digital Equipment Corp. and Hewlett-Packard Co. minicomputers. Norman J. Petterson, a Mentor, Ohio, mill automation consultant at LTV Steel Co. in Cleveland, says many of the consultants he employs come from traditional IS backgrounds but drifted into real-time process control. He says doing so entails learning the mechanics of computers driving production equipment and the linkage of computers with instruments, sensors and gauges.

Understanding engineering terminology is also important, Petterson says. "Engineers are less used to working with computer people than business users [are]," he says. "They are less likely to tell you exactly what they want, because they expect more on your part."

For IS professionals, working in steel mills offers an opportunity for fast results not often found in business-oriented IS organizations, Petterson adds. If a mill system is down for several hours, the company could lose millions of dollars, he says.

"There are few areas where you can see the result of computer systems so directly," Petterson says. "You write the programs and then actually see how the process control system moves the equipment, how it starts motors. This is very different from long-term projects done in traditional IS settings."

For "highly motivated Type A" IS professionals, steel mills also offer a more technically challenging environment than the steel makers' front offices, Fugere says.

Much of this technical challenge involves networking mill systems and linking them with business systems. "The need for integration has increased dramatically," says Petterson. There was no need for networking 10 years ago, he adds, but now it is assumed that mill systems will work together and connect with business systems.

At Bethlehem Steel, the cadre of telecommunications and networking professionals is so important that "we lock them up at night," Fugere jokes.

While they tout technical challenges and quick gratification, insiders acknowledge that the steel works are not for everyone.

"People have to not mind working in the mill," Petterson says. "I had a recent graduate in computer science whom I was going to hire, and I took him to the mill to show him the system. There was dirt everywhere. This guy's ambition was to wear a three-piece suit to work everyday. My people wear blue jeans and work boots."

Mason is a Philadelphia-based freelance journalist.

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The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4"	2"
2 columns	2-5/8"	2"
3 columns	4-1/16"	3"
4 columns	5-9/16"	4"
5 columns	6-15/16"	5"
6 columns	8-3/8"	6"
7 columns	9-3/4"	7"

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $13.50 per line or $189.00 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $9.00 per line or $126.00 per column inch. You can run your ad in any two regions for $11.60 per line or $162.40 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs $378.00 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $94.50 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1-4/16 inches wide) by two inches deep (like this sample). This ad would cost $378.00 in our national edition, $252.00 in the Eastern, Midwestern, or Western edition, and $324.80 in two regions; volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
1 column x 2"	$ 252.00	$ 324.80	$ 378.00
2 columns x 2"	$ 504.00	$ 649.60	$ 756.00
3 columns x 3"	$1,134.00	$1,461.60	$1,701.00
4 columns x 5"	$2,520.00	$3,248.00	$3,780.00
5 columns x 7"	$4,410.00	$5,684.00	$6,615.00

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld*'s sister newspapers at special rates. Choose from *Computerworld Focus on Integration, Network World, InfoWorld, Digital News and Federal Computer Week. Call for details.*

Computerworld Recruitment Advertising Order Form

Ad Size:_____ columns wide by _____ inches deep

Issue Date(s): _____

Name: _____

Company: _____

Address: _____

Telephone: _____

Region: ☐ East ☐ Midwest ☐ West **National:** ☐
☐ East/Midwest ☐ Midwest/West ☐ East/West

Send this form to: **COMPUTERWORLD RECRUITMENT ADVERTISING**
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
800-343-6474 (In MA, 508-879-0700)
Telecopier Extensions: 739 or 740

Computer Professionals: Some people have won simply because they refused to lose.

The true measure of a man or woman is how they handle adversity in seeking their career objectives. Certainly it is easier to surrender than it is to fight...but that, obviously, does not lead to victory.

Yet the decision to fight for what you want dictates that you must have some staunch allies to help you in your battle. You'll find them at NCA. We can "give you the tools you need so you can finish the job." They are: thousands of career opportunities, thousands of client contacts (locally and nationally), skilled and experienced counselling and professional representation.

Come in. Call. Or mail your resume to the NCA firm nearest to you. No charge to you ever. Confidentiality is assured. We can advance your computer career as we have for thousands of others. You may then be moved to say, "Never has so much been owed by so many to so few."

National Computer Associates

ATLANTA: DataPro Personnel Consultants
400 Perimeter Center Terrace, Suite 650
Atlanta, GA 30346 (404) 392-4242
BALTIMORE: CIPS Inc.
101 W. Ridgely Road, Suite 7A & 8A
Lutherville, MD 21093 (301) 252-9000
BOSTON: Robert Kleven & Co., Inc.
P.O. Box 636
Lexington, MA 02173 (617) 861-1020
CHICAGO: Thomas Hirtz & Associates
150 North Wacker Drive, Suite 1700
Chicago, IL 60606 (312) 977-1555
CINCINNATI: Task Group
7875 Reading Road
Cincinnati, OH 45237 (513) 821-8275
CLEVELAND: Innovative Resources, Inc.
Statler Office Tower, Suite 426
East 12th & Euclid
Cleveland, OH 44115 (216) 621-4220
COLUMBUS: Management Thomas, Inc.
450 W. Wilson Bridge Road, Suite 340
Worthington, OH 43085 (614) 846-0826
DALLAS: DataPro Personnel Consultants, Inc.
13355 Noel Road, Suite 2001
Dallas, TX 75240 (214) 661-8600
DENVER: Abacus Consultants, Inc.
1777 South Harrison Street, Suite 404
Denver, CO 80210 (303) 759-5064
DETROIT: Electronic Systems Personnel
3000 Town Center, Suite 2580
Southfield, MI 48075 (313) 353-5580
GREENSBORO: DataMasters
P.O. Box 14549
Greensboro, NC 27415-4549
(919) 273-1461
HARTFORD: Compass Incorporated
365 Asylum Avenue
Hartford, CT 06105 (203) 549-4240
HOUSTON: Career Consultants, Inc.
1960 Post Oak Boulevard, Suite 6251
Houston, TX 77056 (713) 626-4100
KANSAS CITY: DP Career Associates
6405 Metcalf, Suite 502
Shawnee Mission, KS 66202 (913) 236-6288
LOS ANGELES: Superior Resources, Inc.
22653 Pacific Coast Highway, Suite 1-105
Malibu, CA 90265 (818) 884-3000
MIAMI: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, FL 33024 (305) 434-6112
MILWAUKEE: EDP Consultants, Inc.
Chancellory Park II, Suite 350
350 N. Sunnyslope Road
Brookfield, WI 53005 (414) 797-8855
MPLS./ST. PAUL: Electronic Systems Personnel
800 International Centre
900 2nd Avenue South
Minneapolis, MN 55402 (612) 338-6714
NEW JERSEY: Systems Search
2040 Millburn Avenue
Maplewood, NJ 07040 (201) 761-4400
NEW YORK: Botal Associates, Inc.
7 Dey Street, Suite 410
New York, NY 10007 (212) 227-7370
PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Media, PA 19063 (215) 565-8880
PHOENIX: Professional Career Consultants
4725 North Scottsdale Road, Suite 209
Scottsdale, AZ 85251 (602) 274-6666
PITTSBURGH: KCS Computer Services, Inc.
400 Penn Center Blvd., Suite 320
Monroeville, PA 15235 (412) 823-8632
ROCHESTER: Traynor Confidential Ltd.
10 Gibbs Street, Suite 400
Rochester, NY 14604 (716) 325-6610
SAN DIEGO: Technical Directions Inc.
5005 Texas Street, Suite 304
San Diego, CA 92108 (619) 297-5611
SAN FRANCISCO: The Computer Resources Group Inc.,
303 Sacramento Street
San Francisco, CA 94111 (415) 398-3535
SEATTLE: Houser, Martin, Morris & Associates
110 110th Avenue N.E., C-90015
Bellevue, WA 98009 (206) 453-2700
STAMFORD: Hipp Waters Professional Recruiting
707 Summer Street
Stamford, CT 06901 (203) 357-8400
ST. LOUIS: Executive Career Consultants
795 Office Parkway, Suite 100-CW
St. Louis, MO 63141 (314) 994-3737
SYRACUSE: CFA Associates Personnel Inc.
5790 Widewaters Parkway
Dewitt, NY 13214 (315) 446-8492
WASHINGTON DC: Bill Young & Associates
8322 Professional Hill Drive
Fairfax, VA 22031 (703) 573-0200
AUSTRALIA: For information, contact the NCA firm nearest to you.

EDP AUDITOR

World Class Opportunities.

ARAMCO, the free world's largest producer and exporter of oil and gas, currently has an opportunity available for an **EDP Auditor** in Saudi Arabia.

BS in Computer Science preferred; BS/BA in Accounting is acceptable. Professional certification in auditing or data processing required. Minimum of 5 years of auditing experience, 3 of which must be in EDP auditing with a "Big 8" firm or large multinational corporation. Ideal candidate will possess the following:

- Ability to write programs in SAS with experience in COBOL and PL/I
- Working knowledge of IMS data base structures and IBM MVS/XA
- Knowledge of DEC/VAX operating systems and design methodologies a plus

Employment with ARAMCO will provide you with an interesting lifestyle in a multicultural environment, including comfortable family living arrangements, free medical care while in Saudi Arabia, fine schools and a broad spectrum of recreational opportunities, plus 36 calendar days of vacation annually, allowing for extensive travel. We provide an attractive compensation package which includes an expatriate premium.

For immediate consideration, please send your resume/salary history to: **ASC, Employment Dept. 06B-034-9, P.O. Box 4530, Houston, Texas 77210-4530.**

ARAMCO

Programmer/Analysts

Move to New Orleans, and move up to Avondale.

Avondale Industries, Inc. is one of the nation's leading shipbuilding, ship repair and modular construction facilities, located in the exciting New Orleans area. We are currently seeking experienced professionals to join our team in the following capacities:

Programmer/Analyst

This position requires significant manufacturing experience, along with a knowledge of BOM, MRP, purchasing and shop orders. Familiarity with COBOL, CICS and DLI is highly desirable.

Analyst

Successful candidate will have a background in Bar Code implementation, preferably within a large manufacturing environment.

Avondale is located in the beautiful Gulf Coast region in one of America's most unique metropolitan areas; and our paid relocation plan will assist you in joining us there.

In addition, we offer a competitive salary and benefits program. Interested applicants please send detailed resume, including salary history and daytime phone number, in confidence to: **Professional Employment, Avondale Industries, Inc., P.O. Box 50280, New Orleans, LA 70150.** Equal opportunity employer m/f/h/v.

Avondale Shipyards Division

RSVP SERVICES

ANALYSTS, PROGRAMMERS, DESIGNERS

If You Have The Right Stuff . . .

2 years minimum professional experience, stable work history, good technical references, U.S. citizenship or green card, and competence in at least one of the following:

- ***UNIX/C • VAX/VMS • IBM MVS • AS/400***
- ***System/38 • Tandem • Ada • RPG III • DB2***
- ***SQL • IDMS-ADS/O • IMS • CICS • ORACLE***
- ***INFORMIX • SYBASE • PACBASE • FOCUS***
- ***INGRES • ADABAS • SNA • VTAM • M&D • MSA***
- ***MAPICS***
- **Communications • Networking • Operating Systems**
- **Compilers • Controls • Parallel Processing**
- **Distributed Systems • Object Oriented Programming**
- **Windowing • DB Development *OR* Administration**
- **SQA/IV&V *OR* CNI • ASW/Sonar • Radar**
- **Supercomputing • CASE • Expert Systems**
- **Circuit Simulation • Microprocessors**

. . . We Have the Right Service

Thousands of placements of computer professionals since 1966; over 1000 client companies and 200 affiliates nationwide; resume preparation and selective distribution; no cost or obligation to you; no sales pressure.

TO APPLY: Mail or FAX resume or call Howard Levin.

RSVP SERVICES
Dept. C, Suite 614, One Cherry Hill Mall, Cherry Hill, NJ 08002
800-222-0153 or FAX 609-667-2606 (refer to Dept. C)

SUNBELT & ATLANTA
$25,000 to $95,000
IDMS/ORACLE/DATACOM/IMS/DB2
VAX/MAPICS/FOCUS/SYS 38/AS 400
TECHWRITERS/DP SALES/IDMS

Need Programmers, Programmer Analysts for Full-Time and Consulting Positions in IBM Shops. Relocation Expenses Paid. Send resume to:

Jim Heard, EDP Consultants, Inc.
3067 Bunker Hill Road, Suite 202
Marietta, Georgia 30062

24-HOUR FAX: 404-973-4052
PHONE: 404-971-7281

Software Engineers Greater New York Area

Does a fast-paced career near the dynamic city of New York interest you?

Compact Software is leading the way in providing CAD and simulation tools to the worldwide engineering community. The Software Engineering Team located in Paterson, NJ is currently seeking outstanding software analysts with a minimum of a Bachelors Degree in Computer Science and 4 or more years experience in one of the following areas:

- Window systems
- UNIX Workstations
- GKS
- C++
- Fortran and 'C' languages
- Data structures
- Apollo or HP systems administration

We invite you to investigate the challenge of a career with Compact Software, a dynamic engineering team providing CAD tools for the 1990s. Please send resume in confidence to:

Director of Software Engineering Dept. C
Compact Software, Inc.
483 McLean Blvd & 18th Avenue
Paterson, NJ 07504

U.S. Citizenship or Permanent Residency required. Principals Only

Compact Software

NETWORK SYSTEMS MANAGER

FMC Corporation, the highly diversified technological leader in the manufacture of machinery and chemicals, is presently seeking a take-charge Network Systems Manager to join our state-of-the-art Dallas Data Center.

This position manages a staff of five systems programmers responsible for the network software (VTAM, NCP, XI, etc.) and hardware (3745s, 3720s, 3708s, etc.) supporting our users' requirements for data communications connectivity to our Wide Area Network. This nationwide network utilizes T1 circuits and remote communications processors to form an SNA backbone network that provides access to our large, centralized data center in Dallas. For remote networks and devices utilizing X.25 and TCP/IP protocols, the Network Systems group also supports gateway and router devices to provide connections to our SNA backbone network. In addition to providing the necessary leadership and direction for the staff, the Network Systems Manager also provides the technical expertise for designing network solutions to meet user performance and connectivity requirements.

The qualified candidate must have a BS degree in Computer Science, Engineering, Math, or equivalent experience, in addition to at least 2 years experience managing the network software support function in a large-scale IBM 3090, MVS/XA environment. The candidate must have extensive knowledge of telecommunications access methods, protocols, communications processors, gateways, and routers. Knowledge of Local Area Networks, Voice technologies, and satellite communications is desirable. Excellent oral and written communications skills are also necessary.

In return for your efforts, we offer a challenging environment, excellent salaries, and comprehensive benefits. For consideration, please send a resume with salary history to: **FMC Corporation, Human Resources Department, P.O. Box 569630, Dallas, TX 75356-9630.** We are an equal opportunity employer m/f.

FMC

COMPUTER PROFESSIONALS

Professional, well-established computer service and sales company in Alaska is seeking independent computer professionals for contract opportunities. Immediate assignments available for individuals with 3 - 5 years experience and expertise in the following areas:

CICS/ADABAS/COBOL — VM - REXX/PROFS
DATACOM/IDEAL — IMS DB/DC, COBOL
IDMS/ADSO — MARK IV — FOCUS

Send resume stating precise hardware/software experience and three references to:

ComRim Systems Inc
500 E 34th. Ave., Suite 200
Anchorage, Alaska 99503
(907) 563-0304

HEIDELBERG GERMANY
DIRECTOR, INFORMATION SYSTEMS AND ADMINISTRATIVE COMPUTING

The University of Maryland's European Division invites applications for the position of Director, Information Systems and Administrative Computing. This position oversees a staff of ten responsible for all administrative computing needs of Maryland's university program of 50,000 students in 16 European countries.

Ideally, candidates should have a minimum of five years of computer system management experience and proven administrative capabilities, preferably in a university environment. A graduate degree is required. Salary will be commensurate with qualifications and experience.

Review of applications will begin 15 September 1989. Expected starting date during January 1990. Applicants should submit a letter of interest, a current resume, and three references to:

The University of Maryland
Search Committee: Director, ISAC
Im Bosseldorn 30
6900 Heidelberg
F.R. Germany
or
FAX:(49) 6221-378300

IDMS OPENINGS

Growing state of the art shop in Omaha has an urgent need for qualified IDMS professionals. Development Manager will have responsibility for multiple project teams in a new systems development environment. Position requires strong managerial skills, IDMS/MVS/COBOL shop experience, and a minimum of a Bachelor's degree. Salary in the 60's. P/A's and S/A's are also needed, requirements include a minimum of 2 years using COBOL and IDMS in an MVS shop. ADS/O experience and a Bachelor's degree a big plus. Salary to 40K, excellent benefits and opportunity, full relocation package. Consider Omaha, rated the 37th best place to live in a survey of 329 metro areas in the U.S.

ROBERT HALF
DATA PROCESSING
7171 Mercy Rd #302
Omaha, NE 68106
(402) 397-8107

ALL FEES ASSUMED BY CLIENT COMPANIES

MS WINDOWS
X-WINDOWS
UNIX,C
VM/CMS, REXX, C
VAX/PASCAL
VAX/VMS
IMS, DB/DC
COBOL
HP3000
FOCUS
ORACLE, SQL
WANGNET
PL/I, I2ICE
SYS 36, RPG III

We are seeking professionals for full or part time assignments. Benefits include excellent weekly pay, diverse work assignments, direct deposit, 9C/BS Major Medical, 401k/Profit Sharing Plan, and referral bonuses. Please call or send resume to:

American Technical Resources Inc.
7363 McWhorter Pl, Ste 202
Annedale, VA 22003
(703) 658-0068
(800) 537-1845

PROGRAMMER ANALYST (IBM) AS400/S38

Southern States Utilities, the largest investor owned utility in the state, is seeking a Programmer Analyst for our Orlando location...just 1/2 hour from major attractions.

The ideal candidate will have 3 years' experience in programming on S/38 and/or AS400 with RPG III, CL, database, sub-files, etc. S/36 RPG II experience is a plus.

In addition to a competitive salary, we offer an excellent benefits package. Relocation assistance is available. Please send your resume, along with salary history/requirements to: MIS, Southern States Utilities, Inc., 1000 Color Place, Apopka, FL 32703. PRINCIPALS ONLY. EQUAL OPPORTUNITY EMPLOYER.

SYSTEMS PROGRAMMER

Florida Opportunity

Tallahassee Memorial Regional Medical Center is a 771-bed major medical referral center located in Florida's Capital City. Our Management Information Services is running an IBM 3090-150E with a network of 190 terminals and 65 printers. This programming position requires 2-3 years experience in support and maintenance of MVS/XA, TSO, RACF, VTAM & NCP; degree preferred. In addition to an excellent professional growth opportunity, and no state income tax we offer a university setting in close proximity to the beautiful Gulf of Mexico. We also offer the highest starting salaries in the area and a benefit package complete with health and life insurance, paid leave time, retirement, credit union, tuition reimbursement and on-site child care. If you are interested in working in a progressive MIS department of a major medical center respond by sending your resume to:

Personnel Dept.
1-800-347-0579
TALLAHASSEE MEMORIAL REGIONAL MEDICAL CENTER
Magnolia Drive
Tallahassee, FL 32308
an equal opportunity employer m/f/v/h

DATA PROCESSING INTERNATIONAL PROGRAM MANAGER

Opening for International Program Manager responsible for coordination of international projects involving proprietary software products, establishment of communication network, and international customer and sales support activities. Must have international experience in program management and customer support including knowledge of international currency and statutory requirements. Must have at least 3 years of international software marketing experience, 6 years experience in a data processing environment, with technical experience in DBMS; TP Monitors; medium system environments; operating systems; and PC applications. Two years college req. Salary $45,000. 40 hours. M-F. Apply with resume: Georgia Department of Labor, 2811 Lakewood Avenue, S.W., Atlanta, Georgia 30315 or to the nearest Georgia Job Service Center. Control #GA 5378601. EOE.

POSITION WANTED
Contract Software Consultant
Boston Area

Skilled in –
Ada - Assembler - Basic C, - Cobol - MS/DOS Pascal - PLI, etc.

Other areas of expertise include:
File and Database Systems, Spreadsheets, SQL, dBase, Communication - Kermit and Interactive Forms Display

Contact:
Bruce Donaldson
Lionel Software
108 Fox Hill Street
Westwood, MA 02090
(617) 326-2280

CA & AZ CONTRACTS

CONSULTANTS WANTED

P. Murphy & Associates, Inc.
4405 RIVERSIDE DRIVE, SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122

SYSTEMS ANALYST. Analyze clients' business procedures & problems to refine data & convert it to programmable form for electronic DP. Confer w/clients ascertaining specific output reqs in terms of type & data summarization, & format for subsequent output. Study existing data handling system of employer to evaluate effectiveness, develop new systems to improve production & work flow. Consult w/clients concerning general micro-computer services including problem solving & trouble shooting. Requires M.S. in Business or Management WITH Microcomputer applications or computer science course emphasis, & working knowledge of Excalibur PREMIER PLUS Software. 40 hrs/wk, 9-5 M-F, $30,875/yr. Qualified applicants submit resume to Colorado Dept of Labor & Employment, 600 Grant St. #900, Denver, CO 80203, Job Order #CO3052682.

PROGRAMMERS
Contract Assignments
$25-30 Per Hr.+

The best in the Business

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, "C," ASSEMBLER, PL-1, etc.). Contract assignments 12 mos. + $25-30/hr. + benefits package. *In confidence, contact Al Madsen, CEC.*

CORPORATE PERSONNEL CONSULTANTS, INC.
3705 Latrobe Drive, Suite 310
Charlotte, NC 28211
(704) 366-1500

I E F CASE Tool

IEF CASE Tool experts needed to do analysis and data modeling. Must have 5+ years experience with the last two years doing data analysis using IEF CASE Tool.

Call, send or Fax resume to:

Software Dynamics Corporation
5215 N. O'Connor, Suite 200
Irving, TX 75039
(214) 552-1673
FAX# (214) 869-4550

Computer
Software Developers

Professional, well-established Software Development Company seeking experienced Software Development Professionals to work on a New Generation of highly-integrated Business Systems. UNIX, C, 4GL, RDBMS environment. Great location, excellent opportunities, permanent position. Send resume to: Technical Personnel, DIS Corp., 288 W. Kellogg Road, Bellingham, WA 98226. EOE.

DIS CORP.

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM COBOL MAINFRAME APPLICATIONS; CICS; IDMS; IMS; ADS O; ORACLE; DB 2; UNIX; SAS; VM/CMS; S/38 RPGIII or COBOL; AS400; DEC VAX COBOL or FORTRAN; PICK O/S. Financial, Mfg., Health Care, Banking, Insurance; MVS, VM, NCP, VTAM or CICS Systems Progrs; DEC/VAX Systems Mgrs; RACF, CPCS, Adabas internals, PC LAN; Database Analysts; Office Automation. Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3924 Browning Pl., Suite Z
Raleigh, NC 27609
(919) 782-3024

Where's The Beach?
SAN DIEGO
S/38 Programmers

We support two S/38's serving 130 local and 100 remote CRT's. Position entails design, programming, testing, implementation, and documentation. Requires 2-3 years' S/38 exp. using RPG III, CL, Database and IBM utilities. 30K+

Please send resume to:
NATIONAL PEN CORP.
HUMAN RESOURCES DEPT.
9431 Dowdy Dr., San Diego, CA 92126
(619) 566-7800 x241
We conduct Pre-Employment drug testing and maintain a smoke-free environment. EOE

UNISYS
TRAVELING PROGRAMMERS

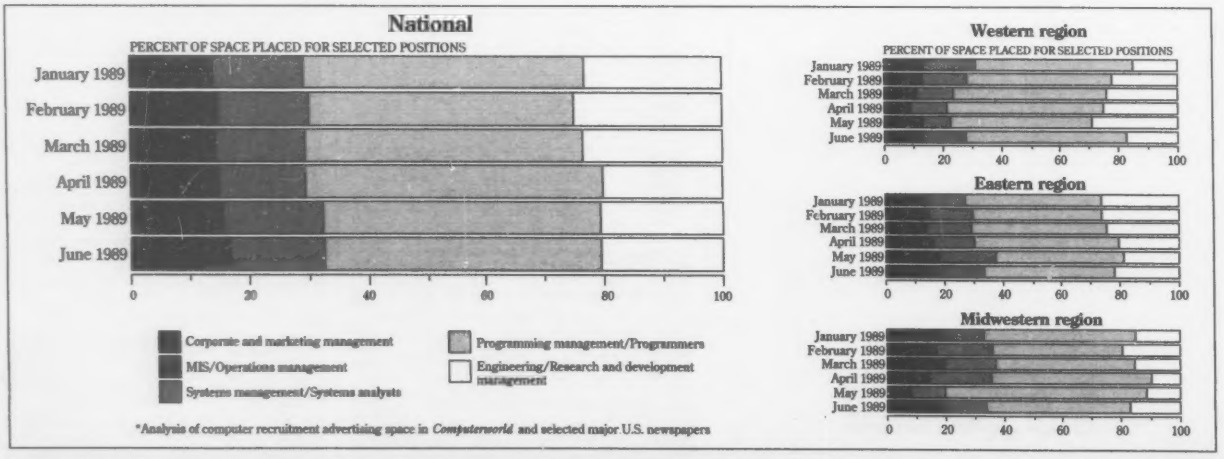
Computer services firm needs PROGRAMMERS and ANALYSTS to support customers at various U.S. locations. Requires 2-10 yrs. U1100 COBOL or MAPPER exp.

We are a permanent placement service specializing in UNISYS (Sperry & Burroughs) Programmers. Our service is free to candidates. Call toll free:

COMPUTER STAFFING
10061 Talbert Avenue
Fountain Valley, CA 92708
800 / 88UNISYS

CAREER INDEX

Computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

SOURCE: CW PUBLISHING, INC. RECRUITMENT MARKET RESEARCH DATABASE

CW CHART: FRANK C. O'CONNELL

GREAT WORK
GREAT PLACE
GREAT PEOPLE

At least that's what our people tell us. We believe in putting our people first, in providing effective management, and in encouraging individual achievement. That's why we're leading the way in the electronics distribution industry.

MIS DIRECTOR

As the Corporate Director of MIS, you will oversee all MIS operations, applications development and voice & data communications. You must have a BA/BS, 10 years' management experience plus 5 years' development experience including system architecture and complex applications with an emphasis in sales and inventory systems. Knowledge of on-line transaction processing systems, voice and data comm, micros/connectivity/networking, and EDI is also required. A project planning backround is essential, as is personal use of a PC.

We offer an excellent benefits package and a competitive salary. For immediate consideration, please send your resume to Anthem Electronics, Inc., 1040 E. Brokaw Road, San Jose, CA 95131. An equal opportunity employer.

Anthem

Electronic, Electrical and Computer Engineers

EG&G Idaho, Inc. is the prime operating contractor for the Department of Energy at the Idaho National Engineering Laboratory (INEL). We are situated in Idaho Falls (population 43,000), a pleasant community located on the scenic Snake River and within 2-3 hours of such national attractions as Yellowstone, Sun Valley, Jackson Hole and the Tetons.

We are seeking resumes from Senior, Intermediate, and newly graduated Electronic, Electrical and Computer Engineers.

Experience in one or more of the following is desired: instrumentation and controls, nuclear instrumentation, electronics, hardware testing, software testing, measurement systems, software integration (UNIX, C, VMS), power systems, artificial intelligence, electronic packaging, electromagnetics, robotics, video/digital/RF communications, cost and schedule integration and security planning.

Qualifications include a Bachelors Degree, MS preferred. Applicable experience required for advanced positions.

Please send resume, letters of reference and salary history to **Employment Services, (TB-136), EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, Idaho 83415-3127.** An Equal Opportunity Employer M/F/H/V. U.S. Citizenship required.

EG&G Idaho, Inc.

UNIX is a trademark of AT&T.

CHIEF INFORMATION OFFICER

The University of Texas M.D. Anderson Cancer Center, one of the world's leading comprehensive cancer institutions, offers the highest quality cancer care, research, education and prevention available.

We are seeking an Associate Vice President & Chief Information Officer with a MS or MBA and 5+ years of senior managerial experience in a large organization, preferably in a hospital, university or government organization, to become the principal administrative officer for Information Technology and to provide strong leadership in defining information needs, identifying resources, using new information technologies, and managing the flow of information in an exciting and diverse academic environment.

Responsibilities:

- Direct operations in the Division of Information Services
- Provide primary direction for all decisions involving the use of computers and voice-data networks
- Use information technology to enhance our position as a world leader in cancer treatment, prevention and research
- Create a long-term strategy to support the operations of patient care and administrative information systems, and academic computing resources
- Direct the preparation of operating budget requests
- Establish guidelines and procedures for the use of all information technology and related equipment
- Collaborate in a systematic way with researchers and clinicians to assure easy access to vital patient care data for analyses/studies

M.D. Anderson Cancer Center offers a competitive and comprehensive benefits package. Qualified candidates are encouraged to respond to: **M.D. Anderson Cancer Center, Chairman of the Search Committee, 1515 Holcombe Blvd., HMB 194, Houston, Texas 77030.**

THE UNIVERSITY OF TEXAS M.D. ANDERSON CANCER CENTER

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(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs? What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
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MARKETPLACE

The pros and cons of leasing

Whether buying is the preferable option depends on a myriad of factors

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

Are you about to acquire a computer? Have you investigated whether it would be more advantageous to lease the machine rather than buy it? Either process can be complicated. The preferable route depends on your circumstances. The decision to lease or buy often hinges on the following considerations:

Cash position. You may not have enough cash to complete a purchase. Borrowing money may not be possible or may hurt key financial measures such as the debt-to-equity ratio. In such cases, leasing can be preferable even if it costs more.

Cost of money. Your cost of money is probably the second most important consideration. The following factors directly determine the cost of cash:

- Interest, when equipment is bought with borrowed money or through installment payments to the seller.
- Impact on total corporate borrowing when you purchase a machine with cash on hand.
- Income taxes. You should calculate costs after allowing for any reduction of income taxes that may result from a lease or purchase.

Residual value. The resale value of the equipment, if any, can lower your ultimate cash outlay when buying. Residual values also affect the demand for subleasing and are therefore a factor in the cost of leases. Residual values during the first three years of a machine's life usually have a significant impact on costs; after that, the values have little effect.

Budget position. Buying is often more attractive than leasing from the perspective of departmental budgets because they typically use straight-line depreciation over a five-year life; this approach leaves budgeted costs for purchases significantly lower than for lease financing.

Financial statement. The impact of an acquisition on the stockholders, creditors and outside regulatory agencies must also be considered.

Leasing is attractive to many corporations for several reasons. Computer leasing is a form of borrowing that generally entails a lower effective interest cost than direct borrowing because the lessor expects to recoup the equipment's residual value.

Some leases are classified as operation leases, as opposed to capital leases. Payments for these do not increase corporate long-term debt. Leasing is therefore often referred to as a form of "off-balance sheet financing" that does not negatively affect debt-to-equity ratio.

Financing a large transaction through leasing may be less difficult than doing so through buying. In big organizations, using internal cash for major purchases can require an involved justification and other arrangements that may be time-consuming and politically sensitive. If money is borrowed, the loan has to be arranged.

Corporate policies may make lease financing easier to justify or clear, so that a lease can be completed in days, particularly if a master agreement has been established.

Many large organizations, particularly government agencies or government-funded projects, operate on two budgets: an operating budget, commonly used for recurring monthly items such as payrolls and supplies, and a capital budget, typically used for major, one-time purchases. Firms that use this double-budget method often set a limit for operating-budget costs.

Since part of every dollar spent reflects a reduction in tax liability, leasing is especially advantageous when a corporation pays no income taxes because of operating losses or has a one-time tax loss associated with the disposition of assets.

Many users work in an environment of growth and change, which means that the useful life of equipment is uncertain. Today, there is a great risk of obsolescence for many types of computers. Since a lease can be structured to impose a known cost over a variety of time periods, it can simplify budgeting.

If the equipment is purchased, however, the total cost will not be known until the equipment has been fully depreciated, which requires five years under current tax laws.

The lease contract can be tailored to the needs of a given transaction. Among the many elements that can be customized are timing of payments, payment amounts and options to purchase or sublease installed equipment.

It may be possible to minimize the impact of a dramatic shift in residual values over short periods of time — 12 to 24 months — when unforeseen events can cause the residual values to fall below expectations. A major price cut or a new product introduction may cause residual values to evaporate overnight.

If equipment is used in a project for which costs are being reimbursed and the contract does not treat purchased and leased assets differently for claims purposes, leasing often allows a contractor to pass along a greater portion of its expenses than purchasing.

Erbschloe is a managing editor at Computer Economics, Inc. in Carlsbad, Calif.

> CORPORATE POLICIES may make lease financing easier to justify or clear, so that a lease can be completed in days, particularly if a master agreement has been established.

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The BoCoEx index on used computers

Closing prices report for the week ending August 18, 1989

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XT Model 089	$1,025	$1,400	$950
AT Model 099	$1,625	$1,850	$1,400
AT Model 239	$1,800	$2,100	$1,700
AT Model 339	$1,850	$2,000	$1,700
PS/2 Model 50	$1,675	$2,000	$1,600
PS/2 Model 60	$2,800	$3,300	$2,500
Compaq Portable I	$475	$750	$325
Portable II	$1,700	$2,000	$1,650
Portable III	$2,575	$2,800	$2,200
Portable 286	$1,600	$2,000	$1,600
Plus	$900	$1,200	$900
Deskpro 286	$1,950	$2,350	$1,700
Deskpro 386	$2,750	$2,900	$2,500
Apple Macintosh 512	$450	$650	$300
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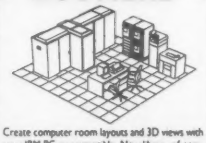

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REQUEST FOR PROPOSALS
(Contract No. C90-1132/RFP)

The New York City Department of Transportation requests proposals for the modification and enhancement of the Management Oriented Street Attribute Information Control System (MOSAICS). Services sought include computer program and database analysis, design, coding and implementation.

A copy of the Request for Proposals (C90-1132/RFP) can be obtained from:

New York City Department of Transportation
Division of Fiscal Affairs
Contracts and Purchasing Unit
40 Worth Street, Rm 1232A, New York, NY 10013
(212) 566-1048

There is a $15 charge for the documents, payable in cash, money order or certified check.

A public conference for potential proposers is scheduled at the offices of the New York City Department of Transportation, 40 Worth Street, 12th Floor Bid Room, in Manhattan, on **August 31, 1989** at 2:30pm.

Sealed proposals must be hand-delivered to the New York City Department of Transportation by no later than 11:00am on **September 29, 1989** at **Room 1232A, 40 Worth Street, New York, NY 10013,** unless extended in an official RFP amendment.

NEW YORK CITY DOT DEPARTMENT OF TRANSPORTATION

The New York City Financial Information Services Agency ("FISA") is reopening a Request for Proposals ("RFP") originally issued on January 25, 1989 and is soliciting consulting firms to form part of a pool of Consultants to provide services on an "as needed" basis in the areas of:

- IMS/COBOL Application Programming
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- IMS DB/DC Programming
- Capacity Planning
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- DB2/COBOL Applications Programming
- DB2 System Programming

FISA will accept new proposals, modifications to previously submitted proposals, or previously submitted proposals "as is". With respect to previously submitted proposals, we require that vendors submit either their modifications or a letter stating that a previously submitted proposal is to be considered "as is" on or before the due date for proposals specified below.

All submissions must contain a repreeentation that the submission constitutes an offer which shall be irrevocable through to 5:00 p.m. on December 29, 1989.

A Proposers Conference will be held at 10:30 a.m. on Wednesday, September 6, 1989 at FISA's office on the 13th floor of 111 8th Avenue in Manhattan City of New York. Proposals will be due on or before 5:00 p.m. Friday September 29, 1989. Copies of the RFP may be secured by calling Ms. Monique Ortiz at (212)206-3111.

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The City of New York Human Resources Administration (Office of Data Processing) is seeking proposals for permanent acquisition of a JCL error verification and standards enforcement software product.

The product must be able to read the entire JCL jobstream, evaluate each statement for correctness of syntax and logic, provide structured JCL reports, enforce installation job standards and format JCL code.

Proposals will be received by Antonino Turrigiano, Human Resources Administration/Office of Purchasing and Materials Management, 30 Main Street, 5th floor, (Station 109), Brooklyn, NY 11201 until 5:00 P.M. September 25, 1989.

Requests for proposals may be obtained from Della King, telephone no. (212) 208-3746/3747.

Ref.#0081699-3543

THE CITY OF SPRINGFIELD, OREGON
REQUEST FOR PROPOSAL
STRATEGIC PLAN

The City of Springfield is seeking proposals for a Strategic Plan. This plan will analyze the current Information Systems and services, and identify future uses of information technology. The plan will also include a 3-year process identifying and prioritizing projects, hardware, software, staffing and training. Copies of the Request for Proposals may be obtained from The City Manager's Office, at the City of Springfield, 225 Fifth Street, Springfield, OR 97477 or by phoning (503)726-3700.

The deadline for the receipt of proposals is October 13, 1989.

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Dispensing with IS dinosaurs

Development and maintenance should run along separate career tracks

BY BILL SEBRELL
SPECIAL TO CW

Information systems management is at a turning point. New systems must be developed using better and faster methods. At the same time, old systems must be maintained, using the older tools and techniques with which they were built.

Unfortunately, introduction of the better and faster methods, such as computer-aided software engineering tools, has not unfolded as smoothly as anticipated; in some cases, it has run into a brick wall. The new tools seem to require a different kind of professional. It is becoming apparent that there must be a rather significant cultural change within systems development.

In the Aug. 7 issue of *Computerworld,* Alfred Hurd warned what future systems analysis will look like. He said that the best analysts will be trained in the arts, business and technology. They will understand data gathering, synthesis and writing, value planning and demonstrate broad business knowledge.

In nearly every company today, the route to the analyst's job begins in the programming ranks. The interviewing, selection and training of these entry-level programmers has evolved from an art to a science; even the personnel people have gotten in on the act, analyzing the aptitudes, experience and education of the successful candidates over many years. The model candidate has now been well-defined, and a considerable number of companies use commercially available aptitude tests to help with the selection process.

The traditional career path has proved to be an excellent channel for developing the IS staff, and there is no question that it will continue to be used for that reason. But based on what is currently happening and the best guesses about the near future, these personnel development programs are really in trouble. As they exist today, they are excellent for selecting the wrong kinds of people for tomorrow and, with a great deal of care and at considerable expense, training them to be dinosaurs.

The problem is that staff-development programs do not seem to be evolving to meet the changing requirements corporations now face; they merely have been tuned for minor tool changes such as the adoption of structured techniques or enhanced to reflect new hardware and systems software.

A major stumbling block to changing staff-development programs is that we have made promises to our current employees, starting when they arrived as entry-level programmers. We told them they would initially do maintenance, implying that if they were successful, they would be promoted to new development work. The maintenance stint serves as a testing and seasoning process.

Now the game has changed. The kinds of people we need for the future — even for new development today — are different from the ones already in the pipeline. We need people with different aptitudes, technical training and work experience. We have to alter our introductory training programs.

What are the alternatives? There are not a lot that make any sense. We know we have to provide some sort of stream of new people; at the same time, we can not ignore the people on-board who have been conscientiously working under the old promises and probably feel they can be trained in the new tools.

Do we take new people and train them in old skills for maintenance — grooming the right kind of person for the wrong kind of job? Do we take the new people and train them only in the new skills and tools? What would this do to the current staff?

Perhaps the best solution is to face up quickly to the fact that our maintenance people and our development people do not require the same training and background. We need to continue the old entry-level training programs, but with fewer people. In doing so, we must clearly state at the outset that an individual on this training track is headed for a career in maintenance — not new development.

We also need to keep a completely new training track aimed at new technologies and tools for people with new backgrounds and aptitudes. Initially, the number of people in this stream will have to be small and should come from current staff.

Fortunately, we can copy many of the techniques for selecting and hiring these people from the old process while also introducing new models and aptitude tests. Also, the training the recruits get about the company — its business, organization and people — can be lifted directly from the old program.

AS THEY EXIST today, personnel-development programs are excellent for selecting the wrong kinds of people for tomorrow and, with a great deal of care and at considerable expense, training them to be dinosaurs.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.

Computerworld's Training Editorial Schedule

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How to make end-users more self-sufficient in problem solving

September 11
Closing the gap between CBT and live instruction with artificial intelligence

September 18
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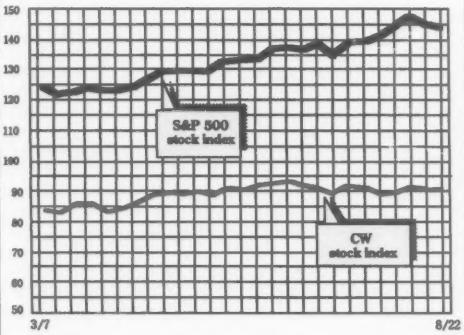

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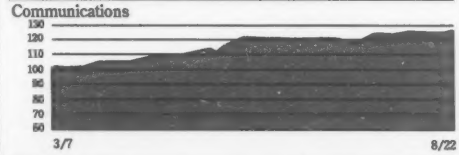

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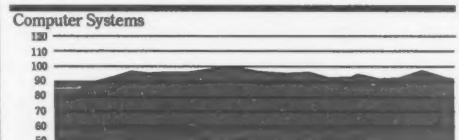

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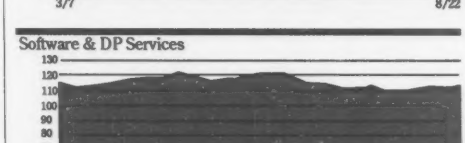

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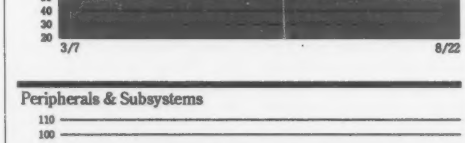
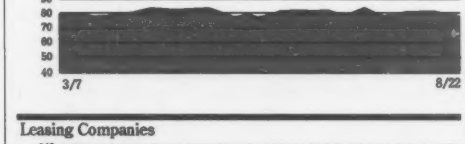


Leasing Companies



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CLOSING PRICES WEDNESDAY, AUG. 23, 1989

EXCH		52-WEEK RANGE		PRICE CLOSE AUG. 23 1989	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	63	44	60.75	0.6	1.0
Q	ANDREW CORP	26	16	23.5	0.0	0.0
Q	ARTEL COMM CORP	8	2	7.375	0.3	3.5
N	AT&T	41	24	38.625	-0.5	-1.3
Q	AVANTEK INC	7	4	5.875	-0.1	-2.1
N	AYDIN CORP	19	13	18	0.5	2.9
N	BELL ATLANTIC CORP	100	68	96.75	0.4	0.4
N	BELLSOUTH CORP	54	39	50.125	-1.0	-2.0
Q	COMPRESSION LABS INC	10	3	10.25	0.6	6.5
Q	COMPUTER NETWORK TECH	3	1	2.376	-0.3	-12.6
Q	CONTEL CORP	66	35	62	-0.9	-1.4
Q	DATA SWITCH CORP	7	4	4	0.0	0.0
Q	DIGITAL COMM ASSOC	31	17	22.875	-0.1	-0.5
Q	DYNATECH CORP	22	17	19.25	0.8	4.1
Q	FIBRONICS INTERNATIONAL INC	7	3	6.5	0.3	4.0
Q	GANDALF TECHNOLOGIES	7	4	6	-0.3	-4.0
N	GENERAL DATACOMM INDS	6	3	5.75	0.1	2.2
N	GTE CORP	61	40	60.125	2.3	3.9
Q	INFOTRON SYS CORP	13	10	10.25	0.5	5.1
N	ITT CORP	64	46	62	-0.3	-0.4
N	M A COM INC	10	6	7.125	-0.1	-1.7
Q	MCI COMMUNICATIONS CORP	42	16	37.5	-0.1	-0.3
N	NETWORK EQUIPMENT TECH INC	25	14	24.5	0.6	2.6
Q	NETWORK SYS CORP	12	8	9.25	0.1	1.4
N	NORTHERN TELECOM LTD	21	14	20.125	-0.3	-1.2
Q	NOVELL INC	38	24	26	1.0	4.0
N	NYNEX CORP	84	65	79.375	0.4	0.5
N	PACIFIC TELESIS GROUP	46	28	44.75	1.5	3.5
A	PENRIL CORP	7	3	6.75	0.8	12.5
N	PLESSEY PLC	46	25	42.5	-1.0	-2.3
N	SCIENTIFIC ATLANTA INC	21	10	19.375	-0.1	-0.6
N	SOUTHWESTERN BELL CORP	58	37	53.25	-1.8	-3.2
Q	3 COM CORP	29	12	12.75	0.9	7.4
N	U S WEST INC	74	54	69.75	-1.9	-2.6
Computer Systems						
Q	ALLIANT COMPUTER SYS	6	3	4.875	-0.1	-2.5
Q	ALPHA MICROSYSTEMS	8	5	7	0.3	3.7
Q	ALTOS COMPUTER SYS	9	6	6.875	0.8	12.2
A	AMDAHL CORP	23	14	14.5	-0.3	-1.7
Q	APPLE COMPUTER INC	50	34	43.75	3.4	8.4
N	BOLT BERANEK & NEWMAN	17	7	7.875	-0.8	-8.7
N	COMPAQ COMPUTER CORP	102	50	91.125	-0.9	-1.0
N	COMMODORE INTNL	20	9	10.125	-1.0	-9.0
Q	COMPUTER AUTOMATION INC	7	3	3.375	0.1	3.8
N	CONTROL DATA CORP	24	16	19.375	-0.1	-0.6
Q	CONVEX COMPUTER CORP	15	7	13.125	0.0	0.0
N	CRAY RESH INC	81	41	45	0.5	1.1
Q	DAISY SYS CORP	9	3	3.75	-0.1	-3.2
R	DATA GEN CORP	21	14	15.5	-0.3	-1.8
N	DATAPOINT CORP	6	3	5.125	0.1	2.5
Q	DELL COMPUTER CORP	13	6	7.625	0.5	7.0
N	DIGITAL EQUIP CORP	122	86	99.625	-1.6	-1.6
N	FLOATING POINT SYS INC	4	2	2.125	-0.3	-10.5
N	HARRIS CORP	35	25	34	0.0	0.0
N	HEWLETT PACKARD CO	62	45	50.375	-2.1	-4.0
N	HONEYWELL INC	92	57	88.875	0.5	0.6
N	IBM	131	106	114	-1.5	-1.3
Q	INFORMATION INTL INC	16	13	14.188	-1.1	-7.0
Q	IPL SYS INC	9	2	7.25	-0.1	-1.7
N	MAI BASIC FOUR INC	20	4	4.125	-0.6	-13.2
N	MATSUSHITA ELEC INDL LTD	204	158	173.75	-4.3	-2.4
Q	MENTOR GRAPHICS CORP	22	12	17	1.0	6.3
N	NBI INC	4	1	2	0.0	0.0
N	NCR CORP	65	51	64.125	2.1	3.4
N	PRIME COMPUTER INC	21	12	12.5	-5.6	-31.0
Q	PYRAMID TECHNOLOGY	20	9	13.75	0.8	5.8
Q	SEQUENT COMPUTER SYS INC	31	14	29.875	1.8	6.2
Q	SHAREBASE CORP	4	2	1.875	-0.3	-11.8
Q	SILICON GRAPHICS CORP	21	14	20.25	-0.3	-1.2
Q	STRATUS COMPUTER	35	21	33.25	3.8	12.7
Q	SUN MICROSYSTEM INC	23	13	18	2.3	16.4
Q	SYMBOLICS INC	3	1	1.813	0.3	20.9
N	TANDEM COMPUTERS INC	24	12	23.125	-0.1	-0.5
N	TANDY CORP	49	36	44.625	-1.1	-2.5
N	ULTIMATE CORP	13	7	9.875	-0.1	-1.3
N	UNISYS CORP	33	20	20.75	-1.0	-4.6
A	WANG LABS INC	11	5	6.25	0.3	4.2
Software & DP Services						
Q	ADVANCED COMP TECH	4	1	1.25	0.0	0.0
Q	AMERICAN MGMT SYS INC	19	11	12.5	0.0	0.0
Q	AMERICAN SOFTWARE INC	18	9	18.125	1.1	6.6
N	ANACOMP INC	10	5	5.75	0.0	0.0
Q	ANALYSTS INTERNATIONAL CORP	19	7	18.25	-0.3	-1.4
Q	ASHTON TATE	28	13	12.875	-0.1	-1.0
Q	ASK COMPUTER SYS INC	18	10	10.375	-1.3	-10.8
N	AUTO DATA PROCESSING	44	35	42.125	-0.6	-1.5
Q	AUTODESK INC	41	23	39.25	1.0	2.6
Q	BMC SOFTWARE INC	24	8	22	-0.3	-1.1
Q	BOOLE & BABBAGE INC	20	9	13.25	-0.3	-1.9
N	BUSINESSLAND INC	15	10	11.375	-0.5	-4.2
N	COGNOS INC	9	5	8	0.1	2.1
N	COMPUTER ASSOC INTL INC	22	12	16.5	1.0	6.5
Q	COMPUTER HORIZONS CORP	10	7	7.25	-0.5	-6.5
N	COMPUTER SCIENCES CORP	56	44	51.375	-0.4	-0.7
N	COMPUTER TASK GROUP INC	17	11	12	-0.5	-4.0
Q	COMSHARE INC	35	18	32.25	0.1	0.4
Q	CORPORATE SOFTWARE	16	9	13.5	-0.3	-1.8
N	CULLINET SOFTWARE INC	10	4	8.125	0.5	6.6
N	GENERAL MTRS (CLS E)	55	39	53.875	0.8	1.4
Q	HOGAN SYS INC	7	4	8	0.3	4.3
Q	INFORMIX CORP	12	7	8.625	0.3	3.0
Q	INTELLICORP INC	5	2	4	0.0	0.0
Q	KEANE INC	19	7	16	0.5	3.2
Q	LEGENT CORP	31	16	28	-0.3	-0.9
Q	LOTUS DEV CORP	28	15	28.75	1.4	5.4
Q	MANAGEMENT SCI AMER	12	6	10.75	-0.1	-1.1
Q	MICROSOFT CORP	68	45	59.25	3.4	6.0
Q	NATIONAL DATA CORP	35	19	32.75	-1.1	-3.3
N	ON LINE SOFTWARE INTL INC	7	4	6.75	0.3	3.8
Q	ORACLE SYS CORP	18	7	18	0.9	5.1
Q	PANSOPHIC SYS INC	18	12	18	0.4	2.4
Q	PHOENIX TECHNOLOGIES INC	19	4	5.375	0.3	4.9
Q	POLICY MGMT SYS CORP	35	21	33.5	-0.3	-0.7
Q	PROGRAMMING & SYS INC	20	13	18.75	0.3	1.4
Q	RABBIT SOFTWARE INC	3	1	0.75	-0.2	-20.0
Q	RELATIONAL TECH INC	17	8	8.875	0.1	1.4
N	REYNOLDS & REYNOLDS CO	34	18	26	0.4	1.5
Q	SAGE SOFTWARE INC	10	6	7.75	1.0	14.8
Q	SEI CORP	20	16	18.75	0.5	2.7
Q	SHARED MED SYS CORP	20	14	15.625	-0.1	-0.8
Q	SOFTWARE PUBG CORP	29	16	22.625	1.1	5.2
A	STERLING SOFTWARE INC	8	5	7.625	-0.4	-4.7
Q	SUNGARD DATA SYS INC	20	13	18.5	-0.5	-2.6
Q	SYSTEMATICS INC	37	28	35.25	0.0	0.0
N	SYSTEM CENTER INC	28	13	23	-1.0	-4.2
N	SYS. SOFT INC	29	13	28.5	2.3	8.6
Q	WORDSTAR	3	2	1.875	-0.1	-6.3
Semiconductors						
N	ADV MICRO DEVICES INC	12	7	8.625	0.1	1.5
N	ANALOG DEVICES INC	13	10	10.125	-0.3	-2.4
Q	ANALOGIC CORP	11	7	9.25	-0.5	-5.1
Q	CHIPS & TECHNOLOGIES INC	26	11	22.5	-0.6	-2.7
Q	INTEL CORP	34	19	30.25	1.4	4.8
Q	LSI LOGIC CORP	12	8	8.75	-0.1	-1.4
Q	MICRON TECHNOLOGY INC	26	13	14.75	0.4	2.6
N	MOTOROLA INC	62	36	57.125	0.0	0.0
N	NATL SEMICONDUCTOR	11	7	7.625	0.3	3.4
N	TEXAS INSTRS INC	47	35	38.875	0.5	1.3
A	WESTERN DIGITAL CORP	15	8	9.5	-0.6	-6.2
Peripherals						
Q	ALLOY COMP	4	1	2.063	0.1	3.2
N	AM INTL INC	6	5	5.625	0.1	2.3
Q	AST RESH INC	11	7	7.625	-0.5	-6.2
Q	AUTO TROL TECH CORP	6	4	4.25	-0.3	-5.6
Q	BANCTEC INC	17	8	17	1.0	6.3
Q	CIPHER DATA PRODS INC	11	7	8	0.0	0.0
A	COGNITRONICS CORP	7	2	5.875	-0.3	-4.1
Q	CONNOR PERIPHERALS	15	7	11.75	0.4	3.3
A	DATAPRODUCTS CORP	18	10	13.125	-0.3	-1.9
A	DATARAM CORP	12	7	10.875	-0.3	-2.2
N	EASTMAN KODAK CO	52	42	50.75	0.9	1.8
N	E M C CORP MASS	6	3	5	0.0	0.0
Q	EMULEX CORP	12	7	7.5	-0.5	-6.3
Q	EVANS & SUTHERLAND	25	13	23.25	-1.0	-4.1
Q	ICOT CORP	3	1	1	-0.4	-27.3
Q	INTERLEAF INC	11	6	7.5	-0.1	-1.6
Q	IOMEGA CORP	5	2	2.563	-0.1	-4.7
Q	LEE DATA CORP	4	2	2.5	0.0	0.0
Q	MASSTOR SYS CORP	4	2	3	-0.1	-4.0
Q	MAXTOR CORP	11	6	9.25	-0.4	-3.9
Q	MICROPOLIS CORP	12	3	4.25	0.6	17.2
Q	MINISCRIBE CORP	11	1	2.438	0.2	8.4
N	MINNESOTA MNG & MFG CO	89	35	78	-1.8	-2.2
Q	PERSONAL COMP PROD INC	6	4	4.5	0.0	0.0
Q	PRIAM CORP	2	0	0.375	0.0	0.0
Q	PRINTRONIX INC	11	7	8.625	0.0	0.0
N	QMS INC	11	6	9.875	-0.4	-3.7
Q	QUANTUM CORP	14	4	14	0.8	5.7
N	RECOGNITION EQUIP INC	13	6	8.125	-0.5	-5.8
Q	REXON INC	8	6	7.125	-0.1	-1.7
Q	SEAGATE TECHNOLOGY	16	7	11.875	0.9	8.0
N	STORAGE TECH CORP	23	11	11.5	-0.6	-5.2
Q	TANDON CORP	2	0	0.563	0.0	0.0
N	TEKTRONIX INC	24	19	21.25	-0.6	-2.9
Q	TELEVIDEO SYS INC	1	0	0.344	0.1	22.4
N	XEROX CORP	89	52	80.75	-0.4	-0.6
Leasing Companies						
Q	AMPLICON INC	115	11	13.5	0.5	3.8
N	CAPITAL ASSOC INTNL INC	9	5	7.125	0.1	1.8
N	COMDISCO INC	30	19	29.75	0.3	0.8
Q	CONTINENTAL INFO SYS	5	0	0.75	0.2	33.2
Q	LDI CORPORATION	17	13	15.5	-0.5	-3.1
Q	PHOENIX AMERN INC	5	3	4.25	0.0	0.0
Q	SELECTERM INC	9	5	8	-0.4	-4.5

EXCH:N = NEW YORK;A = AMERICAN;Q = NATIONAL

Bottoms up

Low prices pique investors' interest; several shares benefit

As *Voyager 2* sent back data on new discoveries from Neptune, investors seemed to be rediscovering the technology market. Prices have reached a level at which buyers believe they can find some bargains. Compaq Computer Corp. climbed 1 point to close Thursday at 92⅜. Microsoft Corp. finished at 59, up 1½ points. Sun Microsystems, Inc. rose 1⅝ points to 16½. IBM and Digital Equipment Corp. also had strong showings; DEC climbed 2¾ points to close at 103, and IBM finished at 116, up 1 point.

Apple Computer, Inc. was awarded part of a $164 million contract to supply the U.S. Air Force with personal computers; Apple added 1⅜ points to close at 44⅛. Automated Data Processing, announcing strong fourth-quarter earnings, finished at 43⅛, up 1⅝. Stratus Computer, Inc., often said to be a candidate for acquisition by IBM, once again benefited from such rumors. Loose lips lifted Stratus 3⅞ points to close at 34. Wang Laboratories, Inc. continued its apparent turnaround, reaching terms with its lenders to restructure its debt and naming a new president and chief operating officer. Wang finished up ¾ of a point at 6¾.

On the downside, Prime Computer, Inc., acquired at last, plunged 5¾ points to close at 12¼. Unisys Corp. dropped 1⅛ points to finish at 20¼, and Ashton-Tate Corp. fell ½ of a point to close at 12.

JOSEPH J. FATTON

Wang's fate in Miller's hands

Former GE exec called turnaround wizard, computer industry neophyte

BY NELL MARGOLIS
CW STAFF

LOWELL, Mass. — In the throes of what analysts see as a fight for its corporate life, Wang Laboratories, Inc. last week handed former General Electric Co. executive Richard W. Miller a quantum of control rarely accorded to anyone whose surname is not Wang.

Miller replaces acting President Harry Chou, who stepped into the breach earlier this month when Frederick Wang stunned the industry by resigning as president of the firm that was founded and, it is widely believed, is still significantly ruled by his father, computer entrepreneur An Wang. Miller was not named chief executive officer.

The new president has no computer industry experience, but some analysts downplayed that fact. "Wang doesn't necessarily need a technologist," said David Wu, who follows the company for S. G. Warburg & Co. "It needs somebody who can downsize — and he'd better be good at it."

Miller *to fill Wang president's shoes*

Apparently, he is. As chief financial officer at The Penn Central Corp., Miller, a Harvard University MBA with roots in finance, was instrumental in the reorganization and spate of acquisitions that led the company out of bankruptcy and tripled its earnings during the next three years. As head of GE's consumer electronics business, he oversaw the revamping and turnaround of two key businesses.

For Wang, "the good news is that there's a blood-and-guts guy coming in, because what they need is expense control in extremis," said Byron Walker, a vice-president at Moody's Investors Service. "GE has the reputation for developing some of the best operations people in the world — tough, but also good at dealing with people."

At the helm of a company for the first time, the 48-year-old Miller faces the challenge of turning around a firm at which customer confidence, employee morale and black ink are careening from legend into history.

"I wouldn't be here if there was any real doubt in my mind that I could do it," Miller said in an interview last week. His plan for straightening out Wang's financial condition, he said, includes the sale of certain nonstrategic assets and an infusion of additional capital, "probably from a secured lender."

In the hours before his appointment, the company came to a debt-restructuring agreement with its current lenders; Miller called the move an important first step. "We [also] have to continue our attack on fixed cost structure. It's way out of sync," he said. Wang is staggering under approximately $1 million of debt and recently announced an unprecedented $424.3 million loss for its fiscal year ended June 30.

Miller said he intends to lead a corporate cultural revolution at Wang. "It's imperative that we have a culture that is completely customer-driven," he said.

Miller's ideas on how to gain and maintain customer satisfaction come from a series of talks with important Wang customers that he conducted prior to accepting the job. Focus, as well as service, will be a key word in the Miller administration. "We have to have a clear statement of our mission," he said.

Prime

FROM PAGE 1

Love, vice-president of Acme Thread & Supply, Inc. in Los Angeles. A breather from the rigid demands of public stockholders, he said, should give Prime the time it needs to focus on creating and marketing technology.

Love's firm is in the process of deciding between a Prime EXL and an IBM RT for its next buy. Last week's events, he said, "have certainly strengthened Prime's position. If MAI had bought them, we'd be very nervous. Now we're hopeful."

At final count, approximately 91% of Prime's shares were tendered to Whitney.

McDonald arrives at Prime with the double imprimatur of seasoned technologist and proven turnaround wizard. A 21-year executive career at IBM supplied the first part; the latter was earned at Gould, where he masterminded a serial reshaping and lucrative sale of the company's operations.

Planitzer and McDonald moved quickly to answer several questions that have plagued Prime employees, customers and industry observers over the past panic-ridden months. Prime will remain headquartered here and will remain essentially intact; no major parts of the company will be sold off.

DAVID LEEPER

McDonald, left, *with new Prime Chairman Planitzer*

Product mainstays will remain. The Series 50, Prime's flagship proprietary minicomputer line, will "remain a strong cornerstone," Planitzer said. Similarly, the Primos proprietary operating system will be maintained and enhanced, McDonald pledged. "We have no intention of leaving the minicomputer business," added McDonald, rebutting industry speculation that Prime's new owners may do exactly that.

However, Planitzer said, "this organization *does* need change." Those changes, he said, include a staged shift toward standards, a personnel cut, a reallocation of research and development expenditures and a corporate reorganization aimed at producing a more decentralized, nimbler Prime.

One element of the old Prime remained strikingly unchanged: "We will continue to aggressively pursue CAD/CAM," McDonald said. Details on all counts, he said, should be forthcoming in mid-October.

The new Prime, McDonald said, will retain the current three-way divide: minicomputers, CAD/CAM and services. However, it will further segment the firm into 10 to 12 "individual businesses." Each will be headed by a newly empowered general manager, many of whom, he said, will emerge from the ranks of Prime employees.

In line with Prime's newly intensive focus on becoming customer-driven, McDonald added, "We'll divide up along focus and customer-oriented lines, not along technological lines. We're going to decentralize decision making." Under McDonald's stewardship, Gould was divided into 22 discrete "profit centers."

McDonald refused to detail the new administration's layoff plans — the specter of which is likely to prove an unsettling backdrop against which to kick off a brave new company. McDonald did, however, move to allay any fears about Prime's ability to pay off its heavy debt.

"We can retire the debt with revenues from the CAD/CAM and Series 50 businesses," he said. "We can service it with revenues from the service side. The core of the businesses are in a lot better shape than you think."

Bad week for LeBow

For many of Prime's employees, last week's buyout by J. H. Whitney was a T-shirt come true.

The "No LeBow" shirts, signs and buttons can now be packed away as mementos of the fight to ward off would-be acquisitor MAI Basic Four and Chairman Bennett LeBow. Other effects of the battle may linger longer — and not just for Prime.

Profits — as well as Prime — eluded MAI last week. The Tustin, Calif.-based company reported a $46.2 million net loss for its quarter ended June 30, in sharp contrast to a $6.8 million net income in the corresponding quarter last year. Third-quarter sales fell to $51.8 million, off 30% from last year's figure. MAI attributed the loss largely to $39.2 million worth of expenses incurred in restructuring its own business and pursuing Prime's.

NELL MARGOLIS

New Prime chief McDonald aims to quell customer fears

BY NELL MARGOLIS
CW STAFF

"If you've ever bought or sold a business," said James McDonald, addressing the press for the first time in his new role as chief executive officer at Prime Computer, Inc., "you know that the worst part — for employees and customers alike — is all the uncertainty they've been going through."

Therefore, the 49-year-old IBM veteran and Gould, Inc. wheeler-dealer said, his first mission will be to dispel as much of that uncertainty as possible.

McDonald said he and newly named Chairman Russell Planitzer will be embarking shortly on a series of visits to customers to allay fears and to gather information that will enable the new leadership to train Prime's focus squarely on the customer.

While customer confusion and the consequent frozen spending have dogged Prime for the past nine months, McDonald could face an even stiffer challenge as he moves to reassure the troops. The new CEO's easy smüe, laid-back drawl and air of quiet confidence are bound to remind many employees of recently departed CEO Joe M. Henson, a leader who was liked and admired.

However, McDonald's track record at Gould also runs the risk of evoking the aura of corporate raider Bennett LeBow, who led MAI Basic Four, Inc. in its hostile pursuit of Prime.

After arriving at the helm of Gould, McDonald said, he realized the need to split it up and sell off the pieces. In contrast, he and the Whitney crew have spent months becoming familiar with every detail about Prime.

The new owners, he said, know the extent of the damage and do not anticipate the need to sell a major piece of the company. Employees last week said they were favorably impressed by the tone of a two-page letter each of them received from the new CEO. "I'm willing to wait and see what he does," said one longtime Prime employee.

Some employees will not get the chance to see, because a layoff is on the early fall agenda. McDonald offered no details but said he hoped to retain approximately 75% of the current executive complement.

Not staying is Anthony L. Craig, who arrived at Prime last October with a mandate to position Prime for the 1990s. Instead of a planned transition under the then-outgoing Henson, Craig was hurriedly catapulted into the CEO slot to lead the charge against MAI and LeBow.

CA automation tools 'impressive'

BY ROBERT MORAN
CW STAFF

NEW ORLEANS — Computer Associates International, Inc. launched a salvo of new and enhanced products last week directed at automated operations in large data centers and at changing the public perception of the company.

At the firm's Systems Software Conference, users who are heavily invested in CA products and pushing toward automated operations were upbeat, even adulatory, about the new products and the closer integration of tools in the firm's systems management software packages, called Unipacks.

"I am impressed but overwhelmed with the level of product integration," said Ross Markley, senior vice-president and director of computer services at Perpetual Savings Bank in Alexandria, Va. He said his technicians will now begin dissecting the announcements.

Thomas Pierce, systems programmer at Leo Burnett USA, a Chicago-based advertising agency, said the company is also working toward unattended operations. "The levels of integration [in CA products] are coming along and getting better with every announcement," Pierce said.

Wang: *'We are not an acquisitions company'*

Leo Burnett is a beta-test site for CA-Dispatch 4.2, a new release of the CA report distribution system. Pierce cited numerous benefits from the announcements and said the new release will now allow CA-Dispatch to communicate directly with CA-7, the automated scheduling package.

However, like other users, Gary Hamel, technical support service manager in the information services division of Saskatchewan Wheat Pool in Regina, said that most of the announcement had been anticipated for the past two years.

Hamel said he was more pleased with the new Event Notification Facility (ENF) within CA-Scheduler Release 7.2, which monitors critical events during downtime for CA-Scheduler and records them. According to Hamel, the new release will "significantly enhance operations because it will enable the company to perform required maintenance, in effect off-line, without affecting operations."

However, CA is using the broad-scoped announcement in part to fight perceptions that are based on its long string of acquisitions — specifically, its high-profile pattern of employee layoffs and quick company consolidations.

"We are not an acquisitions company," said CA Chairman Charles Wang. "We have developed and integrated a lot of products in the past. Other companies have trouble getting out new releases, and CA is talking about seven new products and 22 enhancements."

Analysts, however, said that CA still has to deliver what it has announced.

Lucky seven

Computer Associates last week announced seven products for automated operations, two of which are scheduled for general availability in January.

The other five products announced by CA are expected to enter beta testing in fourth-quarter 1989 or first-quarter 1990 and scheduled to become available about six months afterward. The enhanced products follow similar patterns.

For the mainframe, the company announced APCDDS (dynamic detection systems), a menu-driven report and file balancer; CA-CICSort and CA-CICSort VSE, native sorting facilities for CICS; and CA-Opera VM, an automated messaging and console system for VM data centers.

For the workstation, the company announced CA-Adroit 11, a set of tools, including video, digital audio and compact disk/read-only memory (CD-ROM) storage graphics, that capture the mainframe screen and allow organizations to build a workstation environment. The product was upgraded from Adroit 1, which CA acquired from Applied Data Research, Inc.

From that tool, the company constructed and demonstrated CA-7 Online Consultant, which allows users to navigate from a CA-7 scheduler session to video, audio and text Help while providing an indexed on-line version of CA-7 documentation on CD-ROM. According to CA Chairman Charles Wang, the company is planning to offer variations of Online Consultant for virtually all its software.

Perpetual Savings Bank's Ross Markley said Online Consultant will help the bank "move employees from routine functions to a productive role in the management of the product."

Keith Boerner, senior operations technician at the corporate computer center of J. I. Case Co. in Racine, Wis., said the announcements were not "earth-shattering" but that CA-7 Online Consultant will immediately save users from having to call for assistance on CA-7.

As part of the workstation platform, CA introduced CA-Opera PC, an automated messaging console system that interfaces with CA-Opera in the MVS, VM and VSE environments and will permit systems programmers to run operations away from the data center.

The system, according to Sanjay Kumar, CA vice-president of strategic planning, will consist of a full-function IBM Personal System/2- or AT&T-class computer and will have synchronized files with a laptop. Hardware will cost about $15,000, Kumar said.

ROBERT MORAN

Security products are stronghold at Wang

BY MICHAEL ALEXANDER
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. has undergone considerable upheaval in recent weeks, but its strategy for secure information systems has been a safe port in the financial storm, the firm said last week.

Business at the secure systems division, responsible for developing and marketing IS security products, was up 22% over last year, according to Don Gangemi, Wang's director of secure systems.

NCSC's Sohmer *takes security seriously*

Gangemi said the company calculated that it has about 20% of the more than $1 billion Tempest market, which has been growing at 10% to 15% per year.

Estimates of the market for Tempest done by various research firms vary widely, mainly because Tempest customers — the U.S. military and federal agencies responsible for national security, intelligence gathering and international affairs — routinely classify their need for Tempest equipment.

The Tempest program is one of four key disciplines under the U.S. government's Information Security (Infosec) program, established in 1986 to set standards for protecting U.S. computer resources and information from unauthorized access. Products that meet Tempest standards are shielded to contain or suppress electrical and electromagnetic signals that emanate from computer systems and related gear.

"We expect to see commercial customers using Tempest products before long," Gangemi added.

Executives at Wang warned that commercial customers do not realize just how vulnerable their systems are to electronic eavesdropping by competitors or even foreign intelligence agents. The stray electromagnetic radiations given off by computer systems can be easily intercepted, they explained, allowing the eavesdropper to read the display screens of personal computers hundreds of feet away.

"It's amazing what you can pick up from another computer using only a couple hundred bucks worth of stuff from Radio Shack," said Eliot Sohmer, chief of standards and commercial product evaluations for the National Computer Security Center (NCSC).

Wang officials claimed the company is one of the few with a range of information security products endorsed under Infosec guidelines by the NCSC, a division of the National Security Agency responsible for computer security.

"We thought that this would be the year of computer security in the commercial market, with all of the publicity about viruses and hackers," said Gerry Paul, Wang vice-president of systems. "We're seeing more interest in it, but it hasn't taken off yet."

The same security standards that are now being followed by U.S. government agencies can serve as guidelines for corporations wishing to beef up their computer systems security, Sohmer said.

Star is born

At a press conference last week, Wang introduced a fiber-optic local-area network that supports Ethernet and IEEE 802.3-compatible communications for the Wang PC 280T and PC 38XT series of personal computers. The central connection point for the star-wired topology LAN is a Tempest 802.3 Fiber Optic Hub (FOH), available in five configurations for six to 18 users.

The FOHs can be interconnected to create networks of up to 1,024 workstations, Wang said. The FOHs are priced from $5,200 to $9,800. An optional Fiber Optic Media Interface Card, designed to allow users to add six workstations to a LAN with fiber cabling, is priced at $3,000.

An optional Access Unit Interface Media Interface, used for applications requiring more than a single FOH, is $1,500.

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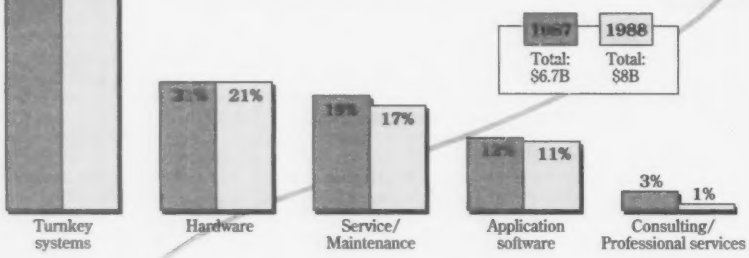
TRENDS

CAD/CAE/CAM

The North American market for computer-aided design, engineering and manufacturing systems grew 19% in 1988.

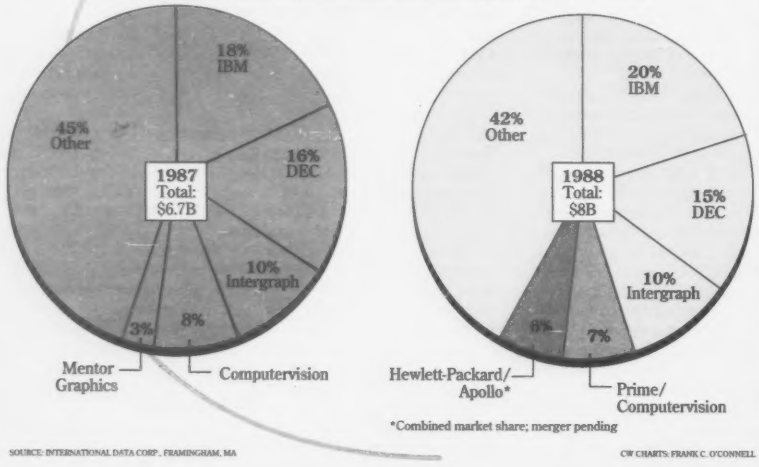
Product configurations and services
(worldwide revenues of U.S. vendors)

While traditional turnkey vendors watch their market share slip away to computer vendors and PC CAD companies, turnkey systems themselves are still popular and gaining momentum.



Market share by worldwide revenues

Fourteen of the top 20 companies have either merged or acquired other companies, with the Hewlett-Packard/Apollo merger creating the biggest ripple in the market.



*Combined market share; merger pending

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MA

CW CHARTS: FRANK C. O'CONNELL

NEXT WEEK

Today, telecommunications can shape a company's business, and unparalleled growth in the technology is increasing the ways to do it. The key to tapping this potential is finding a telecom manager with the right mix of business and technical skills. For help with figuring out where this function fits and how to fill it, turn to In Depth.

HAL MAYFORTH

Are the greenbacks more plentiful elsewhere? No need to wonder how your pay rates stack up; just consult *Computerworld's* annual Salary Survey of IS organizations. Based on over 1,600 responses, it lists average salaries and other compensation for 25 jobs, broken out for 14 regions, nine industries and three ranges of company size.

INSIDE LINES

Want to upgrade your I860?

With its I860 slated to move out the door shortly, Intel is scheduled to announce a potential breakthrough on the microprocessor front Sept. 12. The I960CA will reportedly be able to perform two instructions per clock cycle, more than doubling the processing speed of the 80386. However, don't expect the chip to have any effect on the personal computer market just yet; the I960CA will be part of a product line that is designed to control equipment ranging from cars to factory machines.

Harvest time

The long-awaited rollout of the Macintosh laptop may take place Sept. 20. Apple has a big confab scheduled for the Universal Amphitheatre in Universal City, Calif., that seems the likely forum.

Seen but not heard

Robert T. Morris Jr. and Sr. are not on speaking terms, according to a co-worker of the elder. Morris Jr. has been indicted for allegedly creating the worm program that shut down computers on Internet last year. "They are not on speaking terms, at least as far as the Internet virus thing goes," the co-worker commented. "They have been advised by their attorney not to talk about the Internet incident for fear that Morris Sr. might be called to testify. The only thing he [Morris Sr.] knows about it is that he has to sign a big check to the lawyers once a month."

Best-laid plans?

If last week's Uniforum trade show is any indication, IBM is more comfortable running its AIX Unix-based software on its Personal System/2s for now, at least until the next generation of much improved RT workstations debuts this fall. At the IBM booth, only two RTs were sighted, compared with six PS/2s. However, much to an IBM rep's chagrin, a PS/2 486 billed as the "power platform" crashed while running a prototype Motif program.

Coulda been a contenda!

American Standard, rather than Eastman Kodak, might have been IBM's first major facilities management client if negotiations in the fall of 1988 had turned out differently. IBM approached Gary Biddle, American Standard's top IS executive, with a plan to consolidate and run the firm's data centers. But American Standard, Biddle said, was already "in the 11th hour" of discussions to turn its processing over to Pittsburgh-based Genix.

The indispensible man

The resignation of Gerald Brock, chief of the Federal Communications Commission's Common Carrier Bureau, may be the beginning of the end for the FCC's controversial proposal to extend price caps regulations to local exchange carriers. "Brock is really the only commission employee with the understanding and stature to have guided the plan over the numerous hurdles critics are likely to erect," George R. Dellinger, telecommunications analyst at Washington Analysis Corp., said last week. "The odds of implementation now are nil," Dellinger added.

In and out the window

Intel is well aware that it has a narrow window before IBM gets its own Open Systems Interconnect act together. So the chips-and-more vendor plans to bring out full OSI — well, actually MAP 3.0, but that's what IBM supports, too — for Fastpath, its channel-based network for IBM hosts. Intel has also integrated its IBM OSI solution with Touch's OSI software for DEC VAX/VMS systems, Apple Macintoshes and MS-DOS machines, providing — you guessed it — complete OSI-based multivendor connectivity!

Open letter: Our September dance card is filling up rapidly. So if you're worried about your vendor getting lost in the shuffle, tune in to the CW bulletin board at 508-626-0214 and call it to our attention, or contact News Editor Pete Bartolik at 800-343-6474.

If you're thinking of putting an IBM monitor on your PS/2, you're not seeing the big picture.

When it comes to displays, bigger is better. That's one reason why the Amdek Monitor/432 monochrome VGA has a big edge over IBM's own-standard PS/2 monitor.

But it's not the only reason. Because the 432 is, after all, from Amdek. A company with over 12 years experience in the computer monitor business, and the leading independent monochrome supplier.

The 432's 14" etched-surface, flat screen produces hardly any glare or distortion. And far less eyestrain than Big Blue's PS/2 monitor with its smaller, 12" curved screen.

What's more, IBM's smaller screen also carries a bigger price tag.

So, if you're choosing a monochrome monitor for a PS/2 or any AT compatible, remember the company that hasn't lost sight of the big picture, Amdek. **For the dealer nearest you, call 1-800-PC AMDEK.**

AMDEK

The way most computers are used is an insult to their intelligence.

Your brilliant computer may be dumber than you think.

The sad fact is, while thousands of businesses have hooked up personal computers to mainframes, the majority of those computers are used as "dumb terminals," leaving a vast potential untapped.

For MSA, the intelligent workstation is a promise that should be kept, which is why we are proud to introduce BrightView™ applications software.

By harnessing the power of cooperative processing, BrightView enables the intelligent workstation to perform tasks previously restricted to the mainframe. This revolutionizes the efficiency of your entire computer system, meaning each component can now do what it does best, with valuable mainframe resources freed up for more appropriate tasks.

What's more, MSA is the first company committed to delivering the most extensive line of SAA-compliant software in the industry, and BrightView is already in compliance with SAA's most advanced component, Common User Access. It yields a friendly, consistent look and feel to workstations, helping maximize your investment in both personnel and hardware.

Whatever your software applications needs are, it might be wise to call Robert Carpenter at 404-239-2000. In fact, it's really the only intelligent thing to do.

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ALL ROADS LEAD BACK TO ROME.

In Manufacturing

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Datamation	2.8%
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CIO	2.1%
Digital Review	2.1%
System 3X/400	2.1%
Other**	20.9%
None in Particular	7.0%

Total Respondents: 143

In Finance

Wall Street Journal	11.8%
InformationWEEK	8.4%
MIS Week	4.2%
PC Week	3.4%
Mainframe Journal	3.4%
Datamation	2.5%
Business Week	2.5%
Computers in Banking	2.5%
Other**	28.5%
None in Particular	4.2%

Total Respondents: 119

In Banking

Computerworld	**18.4%**
Wall Street Journal	14.6%
Computers in Banking	11.7%
American Banker	6.8%
InformationWEEK	5.8%
Bank Systems and Equipment	5.8%
MIS Week	4.9%
CIO	3.9%
Other**	17.6%
None in Particular	10.7%

Total Respondents: 103

In Wholesale/Retail

Computerworld	**31.4%**
Wall Street Journal	9.1%
MIS Week	7.4%
InformationWEEK	5.8%
News 3X/400	4.1%
CIO	2.5%
Other**	34.7%
None in Particular	5.0%

Total Respondents: 121

In Insurance

MIS Week	11.6%
Wall Street Journal	9.4%
InformationWEEK	8.0%
CIO	5.1%
Datamation	4.3%
Harvard Business Review	2.2%
Other**	21.0%
None in Particular	4.3%

Total Respondents: 138

In Transportation

News 3X/400	14.4%
MIS Week	7.8%
InformationWEEK	6.7%
PC Week	3.3%
Datamation	3.3%
CIO	3.3%
Wall Street Journal	2.2%
InfoWorld	2.2%
Mainframe Journal	2.2%
Unisys World	2.2%
Other**	25.7%
None in Particular	10.0%

Total Respondents: 90

In Healthcare

Computerworld	**19.9%**
Computers in Healthcare	17.4%
Wall Street Journal	5.0%
CIO	5.0%
InformationWEEK	3.7%
MIS Week	3.7%
Datamation	3.7%
Hospitals	3.7%
PC Magazine	3.1%
Other**	28.3%
None in Particular	6.2%

Total Respondents: 161

In the recent Vertical Markets Study* IS professionals were asked what publication they found most useful. The number one choice among these professionals in all industries:

COMPUTERWORLD

The Newspaper for Information Systems Management

In Utilities

InformationWEEK	12.2%
PC Week	4.1%
MIS Week	4.1%
Wall Street Journal	3.3%
Communications Week	3.3%
Business Week	3.3%
Datamation	2.4%
CIO	2.4%
Mainframe Journal	2.4%
Technical Support	2.4%
Other**	19.3%
None in Particular	8.9%

Total Respondents: 123

In Education

PC Week	9.1%
InfoWorld	5.3%
Datamation	4.8%
PC Magazine	4.3%
MIS Week	2.9%
Digital Review	2.9%
Other**	31.5%
None in Particular	8.1%

Total Respondents: 209

In Government

InfoWorld	6.3%
MIS Week	4.4%
InformationWEEK	3.1%
Mainframe Journal	3.1%
PC Magazine	2.5%
News 3X/400	2.5%
Unisphere	2.5%
Digital Review	2.5%
Other**	29.1%
None in Particular	6.9%

Total Respondents: 159

For more information on the Vertical Markets Study, call Val Landi, Senior Vice-President/Associate Publisher, at (508) 879-0700. Or contact your *Computerworld* sales representative.

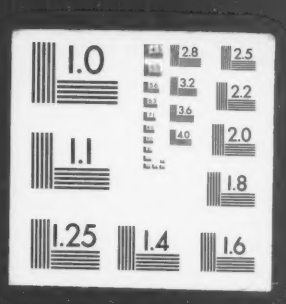
** "The Purchase Decision Process for Computers and Related Equipment Within Ten Vertical Markets" May, 1989.*

*** Those publications receiving less than 2% are grouped in the "Other" category.*

Computerworld Editorial Calendar

Issue Dates		Ad Closing Dates		Editorial Features			Trade Show Distribution	
Computerworld Issue	Computerworld Focus on Integration	Color (any) Executive Reports Product Spotlights Premium Positions	B/W Display	Special Features/ Executive Reports	Product Spotlights	Computerworld Focus on Integration	Computerworld	Computerworld Focus on Integration
Sept. 11		Aug. 25	Sept. 1	Job Satisfaction Survey 2nd Annual *Premier 100* — (Close Aug. 11)			Networld	
Sept. 18**		Sept. 1	Sept. 8	Hardware Roundup: Large & Medium Scale Systems				
Sept. 25		Sept. 8	Sept. 15	Hardware Roundup: PC's, Workstations & Small Scale Systems				
Oct. 2	✔ (Ad Close: Sept. 1)	Sept. 15	Sept. 22	Executive Report: IS as a Catalyst for Business Initiatives		Integration Themes	TCP/IP Conference	Info '89
Oct. 9*		Sept. 22	Sept. 29	Special Report: MIS in the 1990s			Info '89	
Oct. 16		Sept. 29	Oct. 6		LANs			
Oct. 23		Oct. 6	Oct. 13	Executive Report: Security in Open Times				
Oct. 30		Oct. 13	Oct. 20		The Unix Market			
Nov. 6	✔ (Ad Close: Oct. 6)	Oct. 20	Oct. 27	Executive Report: Keeping Up with Service Expectations		Integration Themes		Comdex Fall
Nov. 13		Oct. 27	Nov. 3	Special Report: TBA (Comdex Show Issue)			Comdex Fall	
Nov. 20*		Nov. 3	Nov. 9***	Executive Report: ISDN Products				
Nov. 27		Nov. 9***	Nov. 17		Modems & Muxes			
Dec. 4		Nov. 17	Nov. 22***	Executive Report: Computing in the Executive Suite				
Dec. 11**		Nov. 22***	Dec. 1		OS/2 Software			
Dec. 18		Dec. 1	Dec. 8	Section Feature: Management — Continuing Education for CIOs				
Dec. 25, 1989 & Jan. 1, 1990		Dec. 8	Dec. 15	Forecast '90				

* Starch Ad Study Issue ** Harvey Ad Study Issue *** Note Early Close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